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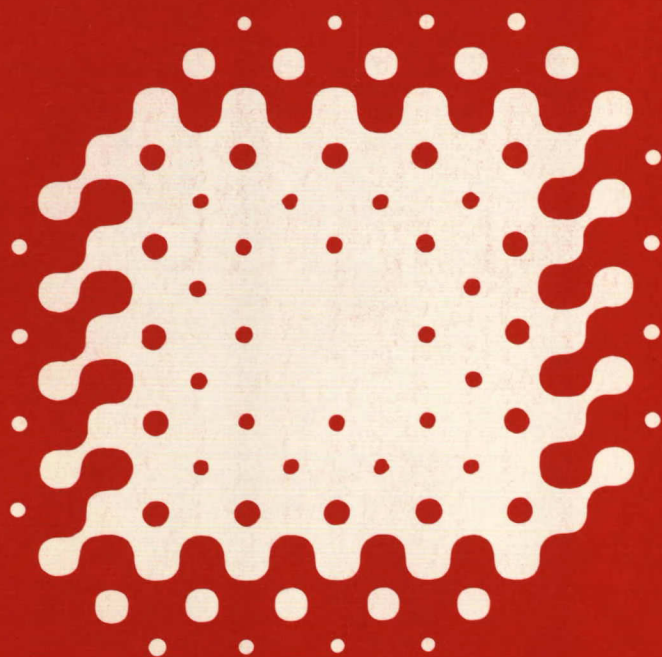
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Recherche sur
la consommation
d'énergie:

une bibliographie
annotée

C. Dennis Anderson
Gordon H. G. McDougall



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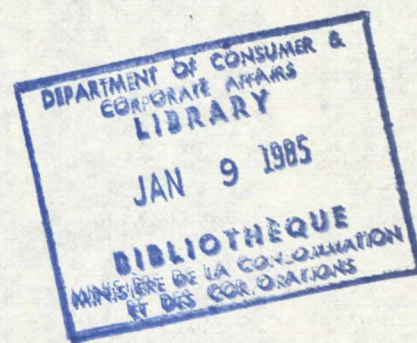
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CONSUMER ENERGY RESEARCH: AN ANNOTATED BIBLIOGRAPHY
RECHERCHE SUR LA CONSOMMATION D'ÉNERGIE: UNE BIBLIOGRAPHIE ANNOTÉE

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Consumer and Corporate Affairs Canada
Direction de l'évaluation et de la recherche
Consommation et Corporations Canada

PREFACE

This document is an updated and expanded version of an earlier annotated bibliography by Dr. C. Dennis Anderson and Carman Cullen (Energy Research from a Consumer Perspective March 1979). It covers the recent North American English literature, primarily from the United States in the area of consumer energy research. The authors would like to acknowledge both the information provided and the material assistance granted by the Consumer Research and Evaluation Branch of Consumer and Corporate Affairs Canada. In particular, we are grateful for the efforts of Dr. Geoffrey Hiscocks, Lee G. McCabe and Carman Cullen who are committed to expanding knowledge in the field of consumer and energy research.

In preparing the annotations, the work of three individuals should be noted. First, we thank Warren Howe who had the job of collecting the original materials not appearing in published form. Warren also provided many of the annotations and the classification scheme, tasks he accomplished with a great deal of skill and initiative. Second, we appreciate the efforts of Kelvin Hussey who collected many of the published papers in the area. Third, the Herculean job of typing the entire bibliography was done by Elsie Grogan in a professional manner which made our work easier and more enjoyable.

We are grateful to two agencies for granting permission to include some of their energy abstracts in this annotated bibliography:

1. The Rand Corporation,
1700 Main Street,
Santa Monica, California, #90406
2. Energy Abstracts,
Technical Information Center,
Department of Energy,
Washington, D.C.

These inclusions helped us both to expand the scope of the annotated bibliography and to shorten its preparation time.

There are a number of other useful bibliographies and reviews for those interested in the consumer energy field. These are:

Bemis, Virginia (1977). Energy Guide : A Directory of Information Sources. New York: Garland Publishing Company.

Cunningham, William H., Sally Cook Lopreato (1977). Consumers' Energy Attitudes and Behavior. New York: Praeger Publishers.

Ellis, Peter, George Gaskell (1978). A Review of Social Research on the Individual Energy Consumer. London: The London School of Economics and Political Science, Department of Social Psychology. Unpublished report.

Energy Information Index (Annual), Energy Mines and Resources, Ottawa.

Farhar, Barbara C., Patricia Weis, Charles T. Unseld, Barbara A. Burns (1979). Public Opinion About Energy: A Literature Review. Prepared for the U.S. Department of Energy. Golden, Colorado: Solar Energy Research Institute. SERI/TR-53-155.

Frankena, Frederick (1977). Energy Intensity: A Selected Annotated Bibliography. Council of Planning Librarians Exchange Bibliography No. 1306. Monticello, Ill.: Vance Bibliographies.

Joerges, Bernward (1979). Consumer Energy Research: An International Bibliography, Internationales Institut Fur Umwelt and Gesellschaft. Berlin. Unpublished Report No. IIUG/79-14.

Morrison, Denton E., et al. (1975). Energy: A Bibliography of Social Science and Related Literature. New York: Garland Publishing Company.

Morrison, Denton E., et al. (1977). Energy II: A Bibliography of 1975-1976 Social Science and Related Literature. New York: Garland Publishing Company.

In addition to the bibliographies and reviews listed above, a wide variety of sources were employed. These additional sources are listed in Table 12 (Journals), Table 13 (Papers Presented at Conferences), and Table 14 (Other Sources).

The authors plan to monitor the consumer energy research field on a continuous basis and to print updated versions of the annotated bibliography either annually or bi-annually. Researchers who have conducted studies in the field are encouraged to share their knowledge by forwarding copies of their results to either author.

In conclusion, it is hoped that this bibliography will provide useful information for both practitioners and researchers in the consumer energy field. Improved understanding of consumer energy consumption and conservation is essential if we, as a society, wish to confront and overcome the energy problems which face us today.

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AVANT-PROPOS

Le présent document est une version revue et étoffée de la bibliographie annotée de C. Dennis Anderson et Carman Cullen "Perspective du consommateur sur la recherche en matière d'énergie : une bibliographie annotée", mars 1979. Il répertorie les publications américaines parues récemment en anglais en Amérique du Nord, dans le domaine de la recherche sur la consommation d'énergie. Les auteurs tiennent à remercier la Direction de l'évaluation et de la recherche en consommation de Consommation et Corporations Canada pour les renseignements et l'aide matérielle qu'elle leur a fournis. Particulièrement, MM. Geoffrey Hiscocks, Lee G. McCabe et Carman Cullen qui ont apporté des connaissances précieuses dans le domaine de la recherche en matière de consommation et d'énergie.

Trois personnes ont travaillé à la préparation des annotations. Il s'agit de Warren Howe, qui a recueilli les textes originaux non publiés, rédigé de nombreuses annotations et conçu le système de classification. Il a fait preuve de beaucoup de compétence et d'initiative. Kelvin Hussey, qui a rassemblé un grand nombre de documents publiés dans ce domaine. Et, finalement Elsie Grogan, qui a dactylographié la bibliographie en entier d'une manière professionnelle, rendant ainsi la tâche plus facile et plus agréable.

Nous tenons également à remercier deux agences qui nous ont permis d'ajouter quelques-unes de leurs analyses dans le domaine énergétique à la présente bibliographie annotée :

1. The Rand Corporation
1700, Main Street
Santa Monica, California #90406
2. Energy Abstracts
Technical Information Center
Department of Energy
Washington, D.C.

Ces ajouts nous ont permis d'étendre le champ d'analyse de notre bibliographie annotée et d'abrégier le temps de préparation.

Il existe un grand nombre d'autres bibliographies et d'études utiles pour ceux qui s'intéressent à la consommation d'énergie.

Bemis, Virginia (1977). Energy Guide: A Directory of Information Sources. New York: Garland Publishing Company.

Cunningham, William H., Sally Cook Lopreato (1977). Consumers' Energy Attitudes and Behavior. New York: Praeger Publishers.

Ellis, Peter, George Gaskell (1978). A Review of Social Research on the Individual Energy Consumer. London: The London School of Economics and Political Science, Department of Social Psychology. Rapport non-publié.

Index des données énergétiques (annuel), Énergie, Mines et Ressources, Ottawa.

Farhar, Barbara C., Patricia Weis, Charles T. Unseld, Barbara A. Burns (1979). Public Opinion About Energy: A Literature Review. Prepared for the U.S. Department of Energy. Golden, Colorado: Solar Energy Research Institute. SERI/TR-53-155.

Frankena, Frederick (1977). Energy Intensity: A Selected Annotated Bibliography. Council of Planning Librarians Exchange Bibliography No. 1306. Monticello, Ill.: Vance Bibliographies.

Joerges, Bernward (1979). Consumer Energy Research: An International Bibliography, Internationales Institut Fur Umwelt und Gesellschaft. Berlin. Rapport non-publié No. IIUG/79-14.

Morrison, Denton E., et al. (1975). Energy: A Bibliography of Social Science and Related Literature. New York: Garland Publishing Company.

Morrison, Denton E., et al. (1977). Energy II: A Bibliography of 1975-1976 Social Science and Related Literature. New York: Garland Publishing Company.

Nous avons utilisé, en plus des bibliographies et études susmentionnées, une grande diversité de sources qui sont énumérées au tableau 12 (périodiques), au tableau 13 (documents présentés à des conférences) et au tableau 14 (autres sources).

Les auteurs ont l'intention de se tenir constamment au fait de la recherche sur la consommation d'énergie et de publier une fois ou deux par année, des versions à jour de la bibliographie annotée. Tout chercheur qui a effectué des études dans ce domaine est invité à en communiquer les résultats à l'un ou l'autre des auteurs du présent document.

Nous espérons que la présente bibliographie fournira des renseignements utiles aux praticiens aussi bien qu'aux chercheurs dans le domaine de la consommation d'énergie. Il importe de mieux connaître la perspective du consommateur en matière de consommation et de conservation de l'énergie si l'on veut envisager les problèmes énergétiques actuels et tenter de les régler.

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INTRODUCTION

The world is moving from an era of apparent abundance to a new age where many resources are rapidly being depleted. One such resource is energy. Those concerned with addressing this problem and attempting to find solutions are accepting conservation as a critical component in establishing a realistic energy policy. Investments in energy conservation are as critical as investments in energy technology or resource exploitation and development. In fact, there are convincing arguments that, in terms of cost effectiveness and positive environmental impact, energy conservation is a superior option to most supply side investments.

Energy consumed in the residential (consumer) sector constitutes an important and sizeable opportunity for conservation efforts. Up to 40% of the energy in developed countries is used in the residential sector. The potential savings available if a number of conservation measures are adopted is calculated at up to 50%. The critical issue is: What strategies are most effective in achieving these levels of energy savings while maintaining a viable economic system and equity for consumers? The issue is complex, requiring answers to many questions. This annotated bibliography is an attempt to collect some of the answers by bringing together research studies which examine the consumer and energy. By increasing our knowledge of consumers' reactions to this problem, we may be able to move more rapidly to an age where efficient and effective use of energy is the norm rather than the exception.

Objectives and Format

In preparing this annotated bibliography, the authors were guided by three objectives:

1. to provide for both practitioners and researchers, a comprehensive package of the existing information in the consumer energy research field;
2. to provide sufficient detail to enable the reader to appreciate the research and the results; and
3. to provide an index classification system that minimized the search time for a reader interested in a particular aspect of consumer energy research.

To accomplish these objectives the following steps were taken. A concentrated effort was made to collect unpublished material as well as to review journals for relevant published articles. A wide variety of sources were contacted, including governments, utilities, research institutes and private firms. A deliberate effort was also made to include agencies outside North America.

For the most part, the bibliography is limited to annotations of empirical studies. However, it includes a number of descriptive and econometric reports which appeared to make a significant contribution to understanding consumers and energy use. Though over 400 annotations are presented, it must be emphasized that this bibliography is in no way offered as a complete collection of all consumer-related energy research to date. The research in this area appears to be expanding exponentially and it proved difficult and time consuming to gather all the sources that might provide relevant information.

The format of the annotations displays the author, date of publication, title and source of the study at the top of the page. Annotations of descriptive reports and some of those obtained from other agencies are presented under the sole title, "Abstract." Annotations of studies are divided into four sections: objectives, method, variables and findings/implications. The implications noted are those mentioned by the authors of the reports, and deal, for the most part, with public policy decisions and further research efforts.

Care was taken to provide a reasonable amount of detail in the annotations to enable the reader to understand the methodology, the results and the degree to which the implications of the study can be generalized to other situations. It is hoped that sufficient detail is provided so that it is only necessary for the reader to obtain the original source for those studies of paramount interest.

Studies are presented in alphabetical order, according to author. All studies have four-digit numbers with each letter of the alphabet, with the exception of the last three, covering 400 numbers.

The content of the studies reviewed is classified in a series of tables presented in the following pages. The tables are intended to provide a summary of sources, types and foci of the various studies. More importantly they are intended to aid researchers interested in specific topics to locate easily those studies most relevant to their work. The studies are categorized using a number of different classification criteria: for example, methodology used, type of energy form, type of policy initiative and type of consumer activity. Details on the classification system are provided in the section, "How to Use the Bibliography." First, a general overview of the studies is presented.

INTRODUCTION

L'abondance apparente dans laquelle nous avons vécu se transforme et les ressources qui semblaient jadis intarissables s'épuisent. Tel est le cas pour l'énergie. Ceux qui sont conscients du problème et qui tentent d'y trouver des solutions considèrent que la conservation est un élément primordial à l'élaboration d'une politique énergétique réaliste. Les investissements pour la conservation de l'énergie doivent être aussi importants que ceux effectués pour le développement de la technologie, l'exploration et l'exploitation des ressources. En fait, tout porte à croire qu'en termes de rendement des coûts et d'impact positif sur l'environnement, la conservation de l'énergie représente une option supérieure aux autres investissements possibles.

L'énergie consommée dans le secteur résidentiel est un aspect important et quantifiable sur lequel il y a lieu d'axer les efforts de conservation. Le secteur résidentiel consomme jusqu'à 40 p. 100 de l'énergie dans les pays développés et, si un certain nombre de mesures de conservation étaient prises, il serait possible de réduire cette consommation de 50 p. 100. Toutefois, comment peut-on réaliser une telle économie tout en assurant la viabilité du système économique et sans pénaliser injustement les consommateurs? La question est complexe et les réponses sont nombreuses. Cette bibliographie annotée tente de fournir un certain nombre de réponses en regroupant la recherche effectuée dans le domaine de la consommation d'énergie. En apprenant à connaître les réactions des consommateurs face au problème énergétique, nous réussirons peut-être à faire de l'utilisation efficace de l'énergie, une norme plutôt qu'une exception.

Objectifs et présentation

Au cours de la préparation de la bibliographie annotée, les auteurs ont poursuivi trois objectifs :

1. offrir aux praticiens et aux chercheurs un répertoire complet de l'information dans le domaine de la recherche sur la consommation d'énergie;
2. fournir suffisamment de précisions dans les annotations pour permettre au lecteur d'évaluer la recherche et ses résultats;
3. concevoir un système de classification d'index qui facilite le travail du lecteur intéressé à un aspect particulier de la recherche sur la consommation d'énergie.

Pour atteindre ces objectifs nous avons concentré nos efforts sur les documents pertinents non-publiés de même que sur les articles de périodique. Notre consultation s'est effectuée auprès de sources diversifiées, telles que des gouvernements, des services publics, des instituts de recherche et des entreprises privées. Enfin, nous avons pris des dispositions pour obtenir des informations d'agences étrangères.

La bibliographie annotée porte principalement sur des études empiriques. Elle comprend un certain nombre de rapports descriptifs et économiques qui semblent avoir fortement contribué à faire comprendre les attitudes des consommateurs face à l'utilisation de l'énergie. Plus de quatre cents annotations sont présentées. D'autre part, et nous tenons à le souligner, nous ne prétendons nullement que la présente bibliographie soit un répertoire complet de toutes les recherches sur le consommateur et l'énergie effectuées jusqu'ici. Les recherches dans ce secteur semblent se multiplier de façon exponentielle et, de toute évidence, c'est un travail de longue haleine que de recueillir toutes les sources susceptibles de contenir des données pertinentes.

Selon le mode d'annotation adopté, le nom de l'auteur, la date de la publication, le titre et la source de l'étude apparaissent dans la partie supérieure de la page. Les annotations des rapports descriptifs et celles qui ont été obtenues d'autres sources sont présentées en bloc sous la rubrique "résumé". Les annotations des études se divisent en quatre parties : les objectifs, la méthode, les variables et les conclusions et répercussions. Les répercussions signalées sont celles que mentionnent les auteurs des rapports et elles se rattachent, pour la plupart, à des politiques gouvernementales et à des travaux de recherche complémentaires.

Nous avons pris soin de fournir suffisamment de renseignements dans les annotations pour permettre au lecteur de comprendre la méthodologie, les résultats et la mesure dans laquelle les conclusions de l'étude peuvent s'appliquer à d'autres situations. Nous espérons avoir fourni assez de précisions pour que la source originale ne soit nécessaire que lors d'une étude de première importance.

Les études sont présentées par ordre alphabétique d'auteurs. Toutes portent un code numérique de quatre chiffres et chaque lettre de l'alphabet, à l'exception des trois dernières, correspond à 400 numéros.

Le contenu des études analysées est classé dans la série de tableaux qui suit. Les tableaux ont pour but de fournir un résumé des sources, des types d'études et de leurs thèmes, afin d'aider les chercheurs qui se penchent sur des sujets précis à trouver facilement les études qui leur seront le plus utiles. Les études sont classées à l'aide de plusieurs critères de classification : par exemple la méthodologie utilisée, le type d'énergie, le type de politique et le type d'activité de consommation. Des précisions sur le système de classification sont données dans la section intitulée "Comment utiliser la bibliographie".

Mais d'abord, voici une vue d'ensemble des études.

OVERVIEW OF STUDIES

Origin

Table 1 presents the studies, classified by origin, first by country and then by source. The vast majority of the studies are American in origin and the proportion of non-North American reports is quite small (3%). Attempts were made to locate more international studies but, at the time of publication, only a few studies were obtained. The reader should not be left with the impression that little work is going on outside of North America. Considerable research is being conducted, especially in Europe, but because of language and other barriers few of the studies are reported here. It is hoped this deficiency will be overcome in the next update of the annotated bibliography.

Distribution by source shows the diversity of the reports presented in the bibliography. Studies originate with governments, utilities, individuals, research institutes, private consulting firms and special interest groups. Some studies have a somewhat mixed origin, such as those commissioned by governments and utilities and prepared by private firms. Again, the number of studies originating with utilities (2%) under-represents their activity. Considerable efforts are being made by utilities but many of the studies are not reported externally or are considered proprietary information.

Methodologies

The bibliography consists mainly of empirical studies, including surveys and experiments (Table 2). A number of descriptive and econometric studies which utilize secondary data in their projections and analyses are also included. Many of the descriptive studies appear because they provide excellent summaries of research in specific areas and point out directions for future research efforts. A number of studies contain elements of both empirical and descriptive efforts.

Attitudes and Behaviour

Table 3 provides a summary of the attitudes and behaviour examined by the various studies. One problem with behavioural research in the consumer energy field is that it is often quite difficult to monitor actual behaviour. For example, details of actual driving habits, purchase decisions or home-related energy behaviour would be difficult and expensive to obtain. Instead, studies frequently must rely upon either self-reported behaviour measures or reported behaviour intentions. The majority of the behavioural studies use surrogate measures for actual energy consumption. Some of the problems with this approach become apparent when reviewing the research based on actual behaviour patterns. Specifically, the lack of relationships between actual consumption and self-reported behaviour may lead one to question some of the surrogate measures employed in consumer energy research.

A number of studies probe consumers' attitudes towards various aspects of the energy situation. The apparent hypothesis is that there is some relationship between energy-related attitudes and energy-related behaviour. It is interesting to note that the conclusions and findings of the various attitude studies do tend to substantiate each other. However, as mentioned, there is a serious issue as to whether attitudes and self-reported energy related behaviour exhibit a strong degree of association with actual energy consumption.

As indicated in Table 3, the attitude studies are grouped into nine categories. The first three (belief, seriousness and blame) are self-explanatory. Studies examining the attitudes concerning the individual's role in conservation generally try to discover if consumers feel they have a role to play in conservation of energy or, conversely, if they feel that their individual efforts will have no effect on the nation's energy consumption. Attitudes towards new technology include not only reactions to nuclear power, but also people's belief in science's ability to solve the crisis and their opinions about the feasibility of solar and other energy sources. Attitudes concerning the environment and quality of life delve into consumers' reactions to tradeoffs between pollution, developing energy sources and the perceived effects on quality of life of living with less energy.

Energy Form

Table 4 classifies the studies by energy form and, as was the case for the other tables, some studies are included in more than one category. Several studies did not deal with specific energy forms.

The distribution of the studies by energy form does reflect, somewhat, the relative usage of the form, notably in North America. The dominance of electricity studies, however, likely reflects the ease with which residential electric consumption data can be obtained.

The nuclear studies are largely concerned with consumers' attitudes towards the use of nuclear power. The solar-related studies involve either or both the description of government and utility programs to develop and market solar power or consumers' perceptions of solar power and its potential for use in the future.

Activity Area

In Table 5, the studies are classified by the two general activity areas upon which they focus: home related and transportation related. Some studies cover more than one area and some monitor behaviour in virtually

all activity areas. A large number examine space heating and appliance use in the home. Those concerned with retrofitting range from ones which concentrate on consumers' behaviour regarding retrofitting to those which discuss the effects of tax credits on such behaviour to econometric studies which estimate the effects on a nation's total energy consumption of retrofitting to some minimum standard. Some home audit studies describe actual home audit programs and their effects on household energy consumption.

As might be expected by the dominance of North America studies, the bulk of the transportation-related studies are concerned with the private automobile. Those which involve public transportation deal mainly with attitudes toward alternative modes and attempt to discover why consumers do not utilize public transit to a greater extent.

Consumer Decision-Making Stage

In Table 6, studies are classified by the stage in the consumer decision-making process upon which they focus. The majority focus is on the post-choice or use stage. The few that focus on the choice stage include those concerned with the choice of large versus small automobiles, appliance choices and decisions regarding the choice of one energy form over another (notably for space heating).

Type of Energy Policy

Table 7 classifies studies by the type(s) of energy policy examined, mentioned, recommended, or for which attitudes are assessed. Policies are classified on two dimensions: financial-non-financial, and mandatory-persuasive.

Financial-persuasive policies include those such as tax credits (for retrofitting or buying a smaller car) and rebates (as incentives to consume less energy). Regulatory-financial policies include price manipulations (e.g., through taxation) by government.

Non-financial-persuasive policies are largely informational types of programs. Non-financial-regulatory policies include those involving legislating new standards for buildings, appliances, automobiles, as well as energy labelling (in most cases), rationing and utility load control.

Also noted in these tables are studies which focus on or mention the distributional impacts of the policies. These studies discuss how different groups are affected to varying degrees by energy policies.

It should again be mentioned that the classification categories used are not mutually exclusive. Most studies mention or discuss more than one of the policy types.

VUE D'ENSEMBLE DES ÉTUDES

Origine

Le tableau 1 présente les études classées selon leur origine, d'abord en fonction du pays, puis en fonction de la source. La grande majorité des études est d'origine américaine et la proportion de rapports qui ne sont pas nord-américains est très faible (trois pour cent). Nous avons tenté de trouver plus d'études internationales, mais au moment de mettre sous presse un petit nombre seulement avaient été recueillies. Il ne faudrait pas en conclure que de telles recherches ne sont effectuées qu'en Amérique du Nord. D'importantes recherches sont menées, en particulier en Europe, mais en raison de barrières linguistiques et autres, ces études sont signalées en nombre restreint dans le présent ouvrage. Nous espérons pouvoir surmonter cette difficulté dans la prochaine mise à jour de notre bibliographie annotée.

Le classement par source montre la diversité des rapports présentés dans la bibliographie. Les études sont l'oeuvre de gouvernements, de services publics, de particuliers, d'instituts de recherche, de bureaux d'experts-conseils et de diverses associations. Certaines études sont en quelque sorte d'origine mixte, par exemple, celles commandées par des gouvernements et des services publics et réalisées par l'entreprise privée. Le nombre d'études effectuées par des services publics (deux pour cent) sous-évalue le travail de ces organismes dans le domaine. En vérité, les services publics ont à leur actif un grand nombre d'études mais beaucoup d'entre elles ne sont pas publiées. Plusieurs sont considérées comme des documents internes.

Méthodologies

La bibliographie se compose en majeure partie d'études empiriques, portant notamment sur des enquêtes et des expériences (tableau 2). Un certain nombre d'études descriptives et économétriques utilisant des données secondaires pour leurs projections et analyses sont également mentionnées. Beaucoup d'études descriptives sont signalées parce qu'elles fournissent d'excellents résumés de recherches dans des domaines précis et servent de guides aux recherches futures. Un certain nombre d'études contiennent à la fois des éléments empiriques et descriptifs.

Attitudes et comportements

Le tableau 3 présente un résumé des attitudes et comportements analysés dans les diverses études. L'un des problèmes de la recherche en matière de comportement dans le domaine de la consommation d'énergie est qu'il est souvent difficile d'observer le comportement réel. Par exemple, il serait difficile et coûteux d'obtenir des précisions sur les

habitudes au volant, les décisions d'achat ou les habitudes de consommation d'énergie à la maison. Il s'ensuit que les études doivent se fonder la plupart du temps sur les interprétations que les personnes interrogées donnent de leurs comportements ou de leurs intentions. La majeure partie des études sur le comportement utilise des mesures de substitution, faute de données sur la consommation réelle d'énergie. Certains des problèmes liés à cette approche sont mis en lumière lorsqu'on analyse la recherche fondée sur les comportements réels. L'écart qui existe, en particulier, entre la consommation réelle et le comportement signalé par l'individu peut nous inciter à mettre en doute la validité de certaines des mesures de substitution employées dans la recherche sur la consommation d'énergie.

Un certain nombre d'études analysent les attitudes du consommateur face à différents aspects de la situation énergétique. L'hypothèse apparente est qu'il existe un certain rapport entre les attitudes et les comportements en matière d'énergie. Il est intéressant de noter que les remarques et les conclusions sur les attitudes tendent à se confirmer d'une étude à l'autre. Cependant, comme nous l'avons dit précédemment, il importe de déterminer si l'attitude et les comportements en matière d'énergie signalés par les intéressés correspondent étroitement à la consommation réelle d'énergie.

Comme le montre le tableau 3, les études sur les attitudes sont groupées en neuf catégories. Les trois premières (l'existence de la crise énergétique, sa gravité, ses causes et ses responsables) s'expliquent d'elles-mêmes. Les études sur les attitudes face au rôle de l'individu en matière de conservation de l'énergie en général tentent de déterminer si les consommateurs considèrent qu'ils ont un rôle à jouer dans la conservation de l'énergie ou si, au contraire, ils estiment que leurs efforts individuels n'ont aucune incidence sur la consommation d'énergie de la nation. Les attitudes à l'égard de la nouvelle technologie ne portent pas uniquement sur les réactions face à l'énergie nucléaire; elles concernent aussi la croyance dans l'aptitude de la science à résoudre la crise, de même que les opinions quant à la possibilité d'utiliser l'énergie solaire et d'autres formes d'énergie. Les études sur les attitudes face à l'environnement et à la qualité de vie portent sur les réactions des consommateurs devant la recherche d'un équilibre entre la pollution, le développement de nouvelles sources d'énergie et les effets connus d'une consommation d'énergie réduite sur la qualité de vie.

Forme d'énergie

Le tableau 4 classe les études selon la forme d'énergie et, comme c'est le cas dans les autres tableaux, certaines portent sur plus d'un type d'énergie. Quelques études traitent de l'énergie en général.

La répartition des études selon la forme d'énergie correspond assez bien à l'usage relatif de chaque forme en Amérique du Nord. Les études relatives à l'électricité sont nombreuses, probablement parce qu'il est facile d'obtenir des données sur la consommation d'énergie à domicile.

Les études sur l'énergie nucléaire sont largement axées sur l'attitude des consommateurs face à l'utilisation de cette forme d'énergie. Les études sur l'énergie solaire traitent de la description des programmes tant de l'État que des services publics pour exploiter et répandre l'utilisation de cette forme d'énergie. Elles portent aussi sur l'opinion des consommateurs en matière d'énergie solaire et de ses possibilités d'utilisation dans le futur.

Secteurs d'activité

Au tableau 5, les études sont classées selon deux grands secteurs d'activité : la maison et le transport. Certaines études portent sur plus d'un domaine, d'autres analysent les comportements d'à peu près tous les domaines du secteur d'activité. Un grand nombre se penchent sur le chauffage et l'utilisation des appareils ménagers. Les études sur la transformation des habitations sont très diverses. Certaines traitent du comportement des consommateurs face à la transformation des habitations, tandis que d'autres étudient les effets des crédits d'impôt sur un tel comportement. Des études économétriques évaluent également les effets de la transformation selon des normes minimales sur la consommation totale d'énergie du pays. Certaines études sur la vérification du rendement énergétique des habitations décrivent les programmes de vérification et leurs effets sur la consommation d'énergie des ménages.

Comme on pouvait s'y attendre, étant donné la prédominance des analyses faites en Amérique du Nord, la majeure partie des études sur le transport porte sur les voitures des particuliers. Les études sur les transports publics s'intéressent principalement aux attitudes face à d'autres modes de transport que la voiture du particulier. Elles cherchent à découvrir pourquoi les consommateurs n'utilisent pas davantage les transports publics.

Prise de décision du consommateur

Au tableau 6, les études sont classées selon les étapes du processus de prise de décision. La plupart portent sur l'étape de l'après-choix ou de l'après-utilisation. Les quelques rares qui touchent l'étape du choix lui-même portent sur des choix entre une grande ou une petite voiture, entre divers appareils ménagers et entre différentes formes d'énergie (en ce qui a trait au chauffage).

Type de politique énergétique

Le tableau 7 classe les études selon des types de politique énergétique qu'ils soient mentionnés, analysés ou recommandés. Les politiques sont réparties selon deux caractéristiques : mesures financières/non financières et persuasion/réglementation.

Les politiques axées sur l'aspect pécuniaire et la persuasion comprennent les crédits d'impôt (pour la transformation des habitations ou l'achat d'une voiture plus petite) et les remises visant à inciter les gens à réduire leur consommation d'énergie. Les politiques axées sur la réglementation et les mesures financières comprennent des changements de prix à la suite d'une taxe fixée par le gouvernement, par exemple.

Les politiques axées sur la persuasion et ne comportant pas de mesures financières sont souvent des programmes d'information. Les politiques qui sont axées uniquement sur la réglementation et qui ne comportent pas de mesures financières, comprennent l'adoption de nouvelles normes pour le bâtiment, les appareils ménagers, les automobiles, l'étiquetage pour la consommation d'énergie, le rationnement et le contrôle de la consommation de l'énergie distribuée par les services publics.

On trouvera également dans ces tableaux des études qui se concentrent surtout sur l'incidence de ces politiques sur la distribution. Ces études expliquent comment différents groupes sont diversement touchés par les politiques énergétiques.

Il convient de noter que les catégories utilisées ne s'excluent pas mutuellement, la plupart des études mentionnant ou analysant plus d'un type de politique.

HOW TO USE THE BIBLIOGRAPHY

The studies contained in the bibliography are listed alphabetically, by author, and each is assigned a four-digit code number. Except for X, Y and Z, each letter of the alphabet is assigned 400 numbers. This is done to facilitate future updates of the annotated bibliography.

The main use of code numbers is to help the reader to identify studies in an area of interest. Tables 8 through 11 contain tabulations of study code numbers for major classifications of research on consumer energy use. Specifically, these tables are:

Table 8 - Study Code Numbers by Attitude/Behaviour Measures Employed

Table 9 - Study Code Numbers by Energy Form

Table 10 - Study Code Numbers by Activity Area

Table 11 - Study Code Numbers by Type of Energy Policy

To illustrate the use of these tables, a reader interested in the effect of non-financial persuasive policies (e.g., advertising programs encouraging consumers to conserve energy) would use Table 11 and select any or all of the code numbers of the studies listed in that section (general information, government information, etc.). The code numbers would then be used to locate the relevant annotation in the bibliography.

COMMENT UTILISER LA BIBLIOGRAPHIE

Les études répertoriées dans la bibliographie sont énumérées par ordre alphabétique d'auteur et chacune porte un code numérique de quatre chiffres. À part les lettres X, Y et Z, chaque lettre de l'alphabet correspond à 400 numéros. Ce procédé a pour but de faciliter les mises à jour de la bibliographie annotée.

L'utilité principale des numéros de code est d'aider le lecteur à trouver des études dans son domaine d'intérêt. Les tableaux 8 à 11 contiennent des relevés des numéros de code d'étude des principales catégories de recherche sur la consommation d'énergie. Ces tableaux sont les suivants :

Tableau 8 - Numéros de codes des études selon les mesures utilisées pour les attitudes et les comportements

Tableau 9 - Numéros de code des études selon la forme d'énergie

Tableau 10 - Numéros de code des études selon les secteurs d'activité

Tableau 11 - Numéros de code des études selon le type de politique énergétique

Par exemple, un lecteur intéressé aux effets des politiques axées sur la persuasion et ne comportant pas de mesures financières (c'est-à-dire les programmes de publicité incitant les consommateurs à conserver l'énergie) utilisera le tableau 11 et choisira un ou plusieurs numéros de code d'études y figurant (information générale, information gouvernementale, etc.). Les numéros de code seront alors utilisés pour trouver l'annotation pertinente dans la bibliographie.

Table 1

Origin of Energy Studies

Origin	Number	Percentage
<u>Country:</u>		
United States	404	90
Canada	31	7
Other	<u>15</u>	<u>3</u>
	450	100
<u>Source:</u>		
Individual	207	46
Research institute/centre	134	30
Government department	51	11
Private organization	40	9
Utilities	11	2
Special interest groups	5	1
Other	<u>2</u>	<u>1</u>
	450	100

Tableau 1

Origine des études sur l'énergie

Origine	Numéro	%
<u>Pays</u>		
États-Unis	404	90
Canada	31	7
Autres	<u>15</u>	<u>3</u>
	450	100
	—	—
<u>Source</u>		
Particuliers	207	46
Centres ou instituts de recherche	134	30
Ministères gouvernementaux	51	11
Organismes privés	40	9
Services publics	11	2
Associations	5	1
Autres	<u>2</u>	<u>1</u>
	450	100
	—	—

INTRODUCTION

L'abondance apparente dans laquelle nous avons vécu se transforme et les ressources qui semblaient jadis intarissables s'épuisent. Tel est le cas pour l'énergie. Ceux qui sont conscients du problème et qui tentent d'y trouver des solutions considèrent que la conservation est un élément primordial à l'élaboration d'une politique énergétique réaliste. Les investissements pour la conservation de l'énergie doivent être aussi importants que ceux effectués pour le développement de la technologie, l'exploration et l'exploitation des ressources. En fait, tout porte à croire qu'en termes de rendement des coûts et d'impact positif sur l'environnement, la conservation de l'énergie représente une option supérieure aux autres investissements possibles.

L'énergie consommée dans le secteur résidentiel est un aspect important et quantifiable sur lequel il y a lieu d'axer les efforts de conservation. Le secteur résidentiel consomme jusqu'à 40 p. 100 de l'énergie dans les pays développés et, si un certain nombre de mesures de conservation étaient prises, il serait possible de réduire cette consommation de 50 p. 100. Toutefois, comment peut-on réaliser une telle économie tout en assurant la viabilité du système économique et sans pénaliser injustement les consommateurs? La question est complexe et les réponses sont nombreuses. Cette bibliographie annotée tente de fournir un certain nombre de réponses en regroupant la recherche effectuée dans le domaine de la consommation d'énergie. En apprenant à connaître les réactions des consommateurs face au problème énergétique, nous réussirons peut-être à faire de l'utilisation efficace de l'énergie, une norme plutôt qu'une exception.

Objectifs et présentation

Au cours de la préparation de la bibliographie annotée, les auteurs ont poursuivi trois objectifs :

1. offrir aux praticiens et aux chercheurs un répertoire complet de l'information dans le domaine de la recherche sur la consommation d'énergie;
2. fournir suffisamment de précisions dans les annotations pour permettre au lecteur d'évaluer la recherche et ses résultats;
3. concevoir un système de classification d'index qui facilite le travail du lecteur intéressé à un aspect particulier de la recherche sur la consommation d'énergie.

Pour atteindre ces objectifs nous avons concentré nos efforts sur les documents pertinents non-publiés de même que sur les articles de périodique. Notre consultation s'est effectuée auprès de sources diversifiées, telles que des gouvernements, des services publics, des instituts de recherche et des entreprises privées. Enfin, nous avons pris des dispositions pour obtenir des informations d'agences étrangères.

La bibliographie annotée porte principalement sur des études empiriques. Elle comprend un certain nombre de rapports descriptifs et économétriques qui semblent avoir fortement contribué à faire comprendre les attitudes des consommateurs face à l'utilisation de l'énergie. Plus de quatre cents annotations sont présentées. D'autre part, et nous tenons à le souligner, nous ne prétendons nullement que la présente bibliographie soit un répertoire complet de toutes les recherches sur le consommateur et l'énergie effectuées jusqu'ici. Les recherches dans ce secteur semblent se multiplier de façon exponentielle et, de toute évidence, c'est un travail de longue haleine que de recueillir toutes les sources susceptibles de contenir des données pertinentes.

Selon le mode d'annotation adopté, le nom de l'auteur, la date de la publication, le titre et la source de l'étude apparaissent dans la partie supérieure de la page. Les annotations des rapports descriptifs et celles qui ont été obtenues d'autres sources sont présentées en bloc sous la rubrique "résumé". Les annotations des études se divisent en quatre parties : les objectifs, la méthode, les variables et les conclusions et répercussions. Les répercussions signalées sont celles que mentionnent les auteurs des rapports et elles se rattachent, pour la plupart, à des politiques gouvernementales et à des travaux de recherche complémentaires.

Nous avons pris soin de fournir suffisamment de renseignements dans les annotations pour permettre au lecteur de comprendre la méthodologie, les résultats et la mesure dans laquelle les conclusions de l'étude peuvent s'appliquer à d'autres situations. Nous espérons avoir fourni assez de précisions pour que la source originale ne soit nécessaire que lors d'une étude de première importance.

Les études sont présentées par ordre alphabétique d'auteurs. Toutes portent un code numérique de quatre chiffres et chaque lettre de l'alphabet, à l'exception des trois dernières, correspond à 400 numéros.

Le contenu des études analysées est classé dans la série de tableaux qui suit. Les tableaux ont pour but de fournir un résumé des sources, des types d'études et de leurs thèmes, afin d'aider les chercheurs qui se penchent sur des sujets précis à trouver facilement les études qui leur seront le plus utiles. Les études sont classées à l'aide de plusieurs critères de classification : par exemple la méthodologie utilisée, le type d'énergie, le type de politique et le type d'activité de consommation. Des précisions sur le système de classification sont données dans la section intitulée "Comment utiliser la bibliographie".

Mais d'abord, voici une vue d'ensemble des études.

OVERVIEW OF STUDIES

Origin

Table 1 presents the studies, classified by origin, first by country and then by source. The vast majority of the studies are American in origin and the proportion of non-North American reports is quite small (3%). Attempts were made to locate more international studies but, at the time of publication, only a few studies were obtained. The reader should not be left with the impression that little work is going on outside of North America. Considerable research is being conducted, especially in Europe, but because of language and other barriers few of the studies are reported here. It is hoped this deficiency will be overcome in the next update of the annotated bibliography.

Distribution by source shows the diversity of the reports presented in the bibliography. Studies originate with governments, utilities, individuals, research institutes, private consulting firms and special interest groups. Some studies have a somewhat mixed origin, such as those commissioned by governments and utilities and prepared by private firms. Again, the number of studies originating with utilities (2%) under-represents their activity. Considerable efforts are being made by utilities but many of the studies are not reported externally or are considered proprietary information.

Methodologies

The bibliography consists mainly of empirical studies, including surveys and experiments (Table 2). A number of descriptive and econometric studies which utilize secondary data in their projections and analyses are also included. Many of the descriptive studies appear because they provide excellent summaries of research in specific areas and point out directions for future research efforts. A number of studies contain elements of both empirical and descriptive efforts.

Attitudes and Behaviour

Table 3 provides a summary of the attitudes and behaviour examined by the various studies. One problem with behavioural research in the consumer energy field is that it is often quite difficult to monitor actual behaviour. For example, details of actual driving habits, purchase decisions or home-related energy behaviour would be difficult and expensive to obtain. Instead, studies frequently must rely upon either self-reported behaviour measures or reported behaviour intentions. The majority of the behavioural studies use surrogate measures for actual energy consumption. Some of the problems with this approach become apparent when reviewing the research based on actual behaviour patterns. Specifically, the lack of relationships between actual consumption and self-reported behaviour may lead one to question some of the surrogate measures employed in consumer energy research.

A number of studies probe consumers' attitudes towards various aspects of the energy situation. The apparent hypothesis is that there is some relationship between energy-related attitudes and energy-related behaviour. It is interesting to note that the conclusions and findings of the various attitude studies do tend to substantiate each other. However, as mentioned, there is a serious issue as to whether attitudes and self-reported energy related behaviour exhibit a strong degree of association with actual energy consumption.

As indicated in Table 3, the attitude studies are grouped into nine categories. The first three (belief, seriousness and blame) are self-explanatory. Studies examining the attitudes concerning the individual's role in conservation generally try to discover if consumers feel they have a role to play in conservation of energy or, conversely, if they feel that their individual efforts will have no effect on the nation's energy consumption. Attitudes towards new technology include not only reactions to nuclear power, but also people's belief in science's ability to solve the crisis and their opinions about the feasibility of solar and other energy sources. Attitudes concerning the environment and quality of life delve into consumers' reactions to tradeoffs between pollution, developing energy sources and the perceived effects on quality of life of living with less energy.

Energy Form

Table 4 classifies the studies by energy form and, as was the case for the other tables, some studies are included in more than one category. Several studies did not deal with specific energy forms.

The distribution of the studies by energy form does reflect, somewhat, the relative usage of the form, notably in North America. The dominance of electricity studies, however, likely reflects the ease with which residential electric consumption data can be obtained.

The nuclear studies are largely concerned with consumers' attitudes towards the use of nuclear power. The solar-related studies involve either or both the description of government and utility programs to develop and market solar power or consumers' perceptions of solar power and its potential for use in the future.

Activity Area

In Table 5, the studies are classified by the two general activity areas upon which they focus: home related and transportation related. Some studies cover more than one area and some monitor behaviour in virtually

all activity areas. A large number examine space heating and appliance use in the home. Those concerned with retrofitting range from ones which concentrate on consumers' behaviour regarding retrofitting to those which discuss the effects of tax credits on such behaviour to econometric studies which estimate the effects on a nation's total energy consumption of retrofitting to some minimum standard. Some home audit studies describe actual home audit programs and their effects on household energy consumption.

As might be expected by the dominance of North America studies, the bulk of the transportation-related studies are concerned with the private automobile. Those which involve public transportation deal mainly with attitudes toward alternative modes and attempt to discover why consumers do not utilize public transit to a greater extent.

Consumer Decision-Making Stage

In Table 6, studies are classified by the stage in the consumer decision-making process upon which they focus. The majority focus is on the post-choice or use stage. The few that focus on the choice stage include those concerned with the choice of large versus small automobiles, appliance choices and decisions regarding the choice of one energy form over another (notably for space heating).

Type of Energy Policy

Table 7 classifies studies by the type(s) of energy policy examined, mentioned, recommended, or for which attitudes are assessed. Policies are classified on two dimensions: financial-non-financial, and mandatory-persuasive.

Financial-persuasive policies include those such as tax credits (for retrofitting or buying a smaller car) and rebates (as incentives to consume less energy). Regulatory-financial policies include price manipulations (e.g., through taxation) by government.

Non-financial-persuasive policies are largely informational types of programs. Non-financial-regulatory policies include those involving legislating new standards for buildings, appliances, automobiles, as well as energy labelling (in most cases), rationing and utility load control.

Also noted in these tables are studies which focus on or mention the distributional impacts of the policies. These studies discuss how different groups are affected to varying degrees by energy policies.

It should again be mentioned that the classification categories used are not mutually exclusive. Most studies mention or discuss more than one of the policy types.

VUE D'ENSEMBLE DES ÉTUDES

Origine

Le tableau 1 présente les études classées selon leur origine, d'abord en fonction du pays, puis en fonction de la source. La grande majorité des études est d'origine américaine et la proportion de rapports qui ne sont pas nord-américains est très faible (trois pour cent). Nous avons tenté de trouver plus d'études internationales, mais au moment de mettre sous presse un petit nombre seulement avaient été recueillies. Il ne faudrait pas en conclure que de telles recherches ne sont effectuées qu'en Amérique du Nord. D'importantes recherches sont menées, en particulier en Europe, mais en raison de barrières linguistiques et autres, ces études sont signalées en nombre restreint dans le présent ouvrage. Nous espérons pouvoir surmonter cette difficulté dans la prochaine mise à jour de notre bibliographie annotée.

Le classement par source montre la diversité des rapports présentés dans la bibliographie. Les études sont l'oeuvre de gouvernements, de services publics, de particuliers, d'instituts de recherche, de bureaux d'experts-conseils et de diverses associations. Certaines études sont en quelque sorte d'origine mixte, par exemple, celles commandées par des gouvernements et des services publics et réalisées par l'entreprise privée. Le nombre d'études effectuées par des services publics (deux pour cent) sous-évalue le travail de ces organismes dans le domaine. En vérité, les services publics ont à leur actif un grand nombre d'études mais beaucoup d'entre elles ne sont pas publiées. Plusieurs sont considérées comme des documents internes.

Méthodologies

La bibliographie se compose en majeure partie d'études empiriques, portant notamment sur des enquêtes et des expériences (tableau 2). Un certain nombre d'études descriptives et économétriques utilisant des données secondaires pour leurs projections et analyses sont également mentionnées. Beaucoup d'études descriptives sont signalées parce qu'elles fournissent d'excellents résumés de recherches dans des domaines précis et servent de guides aux recherches futures. Un certain nombre d'études contiennent à la fois des éléments empiriques et descriptifs.

Attitudes et comportements

Le tableau 3 présente un résumé des attitudes et comportements analysés dans les diverses études. L'un des problèmes de la recherche en matière de comportement dans le domaine de la consommation d'énergie est qu'il est souvent difficile d'observer le comportement réel. Par exemple, il serait difficile et coûteux d'obtenir des précisions sur les

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Secteurs d'activité

Au tableau 5, les études sont classées selon deux grands secteurs d'activité : la maison et le transport. Certaines études portent sur plus d'un domaine, d'autres analysent les comportements d'à peu près tous les domaines du secteur d'activité. Un grand nombre se penchent sur le chauffage et l'utilisation des appareils ménagers. Les études sur la transformation des habitations sont très diverses. Certaines traitent du comportement des consommateurs face à la transformation des habitations, tandis que d'autres étudient les effets des crédits d'impôt sur un tel comportement. Des études économétriques évaluent également les effets de la transformation selon des normes minimales sur la consommation totale d'énergie du pays. Certaines études sur la vérification du rendement énergétique des habitations décrivent les programmes de vérification et leurs effets sur la consommation d'énergie des ménages.

Comme on pouvait s'y attendre, étant donné la prédominance des analyses faites en Amérique du Nord, la majeure partie des études sur le transport porte sur les voitures des particuliers. Les études sur les transports publics s'intéressent principalement aux attitudes face à d'autres modes de transport que la voiture du particulier. Elles cherchent à découvrir pourquoi les consommateurs n'utilisent pas davantage les transports publics.

Prise de décision du consommateur

Au tableau 6, les études sont classées selon les étapes du processus de prise de décision. La plupart portent sur l'étape de l'après-choix ou de l'après-utilisation. Les quelques rares qui touchent l'étape du choix lui-même portent sur des choix entre une grande ou une petite voiture, entre divers appareils ménagers et entre différentes formes d'énergie (en ce qui a trait au chauffage).

Type de politique énergétique

Le tableau 7 classe les études selon des types de politique énergétique qu'ils soient mentionnés, analysés ou recommandés. Les politiques sont réparties selon deux caractéristiques : mesures financières/non financières et persuasion/réglementation.

Les politiques axées sur l'aspect pécuniaire et la persuasion comprennent les crédits d'impôt (pour la transformation des habitations ou l'achat d'une voiture plus petite) et les remises visant à inciter les gens à réduire leur consommation d'énergie. Les politiques axées sur la réglementation et les mesures financières comprennent des changements de prix à la suite d'une taxe fixée par le gouvernement, par exemple.

Les politiques axées sur la persuasion et ne comportant pas de mesures financières sont souvent des programmes d'information. Les politiques qui sont axées uniquement sur la réglementation et qui ne comportent pas de mesures financières, comprennent l'adoption de nouvelles normes pour le bâtiment, les appareils ménagers, les automobiles, l'étiquetage pour la consommation d'énergie, le rationnement et le contrôle de la consommation de l'énergie distribuée par les services publics.

On trouvera également dans ces tableaux des études qui se concentrent surtout sur l'incidence de ces politiques sur la distribution. Ces études expliquent comment différents groupes sont diversement touchés par les politiques énergétiques.

Il convient de noter que les catégories utilisées ne s'excluent pas mutuellement, la plupart des études mentionnant ou analysant plus d'un type de politique.

HOW TO USE THE BIBLIOGRAPHY

The studies contained in the bibliography are listed alphabetically, by author, and each is assigned a four-digit code number. Except for X, Y and Z, each letter of the alphabet is assigned 400 numbers. This is done to facilitate future updates of the annotated bibliography.

The main use of code numbers is to help the reader to identify studies in an area of interest. Tables 8 through 11 contain tabulations of study code numbers for major classifications of research on consumer energy use. Specifically, these tables are:

Table 8 - Study Code Numbers by Attitude/Behaviour Measures Employed

Table 9 - Study Code Numbers by Energy Form

Table 10 - Study Code Numbers by Activity Area

Table 11 - Study Code Numbers by Type of Energy Policy

To illustrate the use of these tables, a reader interested in the effect of non-financial persuasive policies (e.g., advertising programs encouraging consumers to conserve energy) would use Table 11 and select any or all of the code numbers of the studies listed in that section (general information, government information, etc.). The code numbers would then be used to locate the relevant annotation in the bibliography.

COMMENT UTILISER LA BIBLIOGRAPHIE

Les études répertoriées dans la bibliographie sont énumérées par ordre alphabétique d'auteur et chacune porte un code numérique de quatre chiffres. À part les lettres X, Y et Z, chaque lettre de l'alphabet correspond à 400 numéros. Ce procédé a pour but de faciliter les mises à jour de la bibliographie annotée.

L'utilité principale des numéros de code est d'aider le lecteur à trouver des études dans son domaine d'intérêt. Les tableaux 8 à 11 contiennent des relevés des numéros de code d'étude des principales catégories de recherche sur la consommation d'énergie. Ces tableaux sont les suivants :

Tableau 8 - Numéros de codes des études selon les mesures utilisées pour les attitudes et les comportements

Tableau 9 - Numéros de code des études selon la forme d'énergie

Tableau 10 - Numéros de code des études selon les secteurs d'activité

Tableau 11 - Numéros de code des études selon le type de politique énergétique

Par exemple, un lecteur intéressé aux effets des politiques axées sur la persuasion et ne comportant pas de mesures financières (c'est-à-dire les programmes de publicité incitant les consommateurs à conserver l'énergie) utilisera le tableau 11 et choisira un ou plusieurs numéros de code d'études y figurant (information générale, information gouvernementale, etc.). Les numéros de code seront alors utilisés pour trouver l'annotation pertinente dans la bibliographie.

Table 1

Origin of Energy Studies

Origin	Number	Percentage
<u>Country:</u>		
United States	404	90
Canada	31	7
Other	<u>15</u>	<u>3</u>
	450	100
	—	—
<u>Source:</u>		
Individual	207	46
Research institute/centre	134	30
Government department	51	11
Private organization	40	9
Utilities	11	2
Special interest groups	5	1
Other	<u>2</u>	<u>1</u>
	450	100
	—	—

Tableau 1

Origine des études sur l'énergie

Origine	Numéro	%
<u>Pays</u>		
États-Unis	404	90
Canada	31	7
Autres	<u>15</u>	<u>3</u>
	450	100
	—	—
<u>Source</u>		
Particuliers	207	46
Centres ou instituts de recherche	134	30
Ministères gouvernementaux	51	11
Organismes privés	40	9
Services publics	11	2
Associations	5	1
Autres	<u>2</u>	<u>1</u>
	450	100
	—	—

Table 2

Methodologies Used in Energy Studies*

Methodology	Number
Survey (primary data)	225
Experiment	62
Descriptive (secondary data)	121
Econometric model building	60

* Some studies are included in more than one category.

Tableau 2

Méthodologies utilisées dans les études sur l'énergie*

Méthodologie	Numéro
Enquête (données primaires)	225
Expérience	62
Étude descriptive (données secondaires)	121
Élaboration d'un modèle économétrique	60

* Certaines études font partie de plus d'une catégorie.

Table 3

Energy Consumption and Conservation
Attitudes/Behaviour Studies*

Type of Measure	Number
<u>Behaviour:</u>	
Actual behaviour patterns	88
Self-reported behaviour	160
Behaviour intentions	68
<u>Attitudes:</u>	
Belief/knowledge of crisis	58
Seriousness of crisis	58
Causes/blame for crisis	40
Individual's role in conservation	55
Government role (general)	36
Government role (specific policy)	61
Utilities' role	1
New technology	45
Environment/quality of life	70
Lifestyle	13

* Some studies are included in more than one category.

Tableau 3

Études sur les attitudes et les comportements face à la
consommation et à la conservation de l'énergie*

Type de mesure	Nombre
<u>Comportements</u>	
Comportements réels	88
Comportements signalés par les intéressés	160
Intentions de comportement	68
<u>Attitudes</u>	
Croyance dans l'existence de la crise et connaissance de la situation	58
Gravité de la crise	58
Causes et responsables de la crise	40
Rôle individuel en matière de conservation	55
Rôle du gouvernement (en général)	36
Rôle du gouvernement (politiques spécifiques)	61
Rôle des services publics	1
Nouvelle technologie	45
Environnement et qualité de vie	70
Mode de vie	13

* Certaines études font partie de plus d'une catégorie.

Table 4

Energy Form of Energy Studies*

Energy Form	Number
Nuclear energy	19
Solar energy	13
Electricity	171
Gasoline	97
Fuel oil	39
Natural gas	58
Coal	7
Wood	1
Other	1
General	5

* Some studies are included in more than one category.

Tableau 4

Forme d'énergie examinée dans les études sur l'énergie*

Forme d'énergie	Numéro
Énergie nucléaire	19
Énergie solaire	13
Électricité	171
Essence	97
Mazout	39
Gaz naturel	58
Charbon	7
Bois	1
Autre	1
Généralités	5

* Certaines études font partie de plus d'une catégorie.

Table 5

Activity Area of Energy Studies*

Activity Area	Number
<u>Home-Related</u>	
Space heating	113
Space cooling	77
Water heating	66
Appliances	112
General home	46
Retrofitting	28
Home audits	4
<u>Transport-Related</u>	
Public transportation	20
Car/van pools	24
Private automobile	83
Vacation/leisure travel	6
<u>General</u>	87
<u>Commercial sector</u>	4

* Some studies are included in more than one category.

Tableau 5

Secteurs d'activité visés par les études sur l'énergie

Secteurs d'activité	Nombre
<u>Maison</u>	
Chauffage	113
Climatisation	77
Eau chaude	66
Appareils ménagers	112
Habitation en général	46
Transformations	28
Vérifications	4
<u>Transport</u>	
Transport en commun	20
Transport coopératif en voiture ou en camionnette	24
Voiture	83
Déplacements (loisirs-vacances)	6
<u>En général</u>	87
<u>Secteur commercial</u>	4

* Certaines études font partie de plus d'une catégorie.

Table 6

Consumer Decision-Making Stage of Energy Studies

Stage of Consumer Decision-Making Process	Number
Pre-choice	34
Choice	63
Post-choice (use)	331

Tableau 6

Prise de décision du consommateur
dans les études sur l'énergie

Le processus de prise de décision du consommateur	Nombre
Antérieur au choix	34
Choix	63
Postérieur au choix (utilisation)	331

Table 7

Type of Energy Policy Studies*

Policy Type	Number
<u>Financial:</u>	
Persuasive - general information	1
- voluntary efforts	5
- tax credits	28
- rebates	21
Regulatory - general policy	6
- time-of-day pricing	17
- price changes/surcharge	107
<u>Non-Financial:</u>	
Persuasive - general information	20
- government information programs	55
- energy labelling	16**
- utility information programs	11
- consumption feedback	31
- voluntary efforts	31
Regulatory - general policy	8
- rationing	40
- utility load control	26
- standards	31
- speed limits	1
- bulk metering	5
- environment controls	3
<u>General Considerations:</u>	
- Equity of policies (i.e., distributional effects)	42

* Some studies are included in more than one category.

** Some energy labelling programs are mandated by governments.

Tableau 7

Type de politique énergétique étudié*

Type de politique	Nombre
<u>Avec mesures financières</u>	
Persuasion - information générale	1
- efforts spontanés	5
- crédits d'impôt	28
- remises	21
Réglementation - politique générale	6
- fixation des prix selon le moment de la journée	17
- changements des prix/surtaxes	107
<u>Sans mesures financières</u>	
Persuasion - information générale	20
- programmes d'information gouvernementaux	55
- étiquetage de la consommation de l'énergie	16**
- programmes d'information des services publics	11
- réactions en matière de consommation	31
- efforts spontanés	31
Réglementation - politique générale	8
- rationnement	40
- contrôle de la consommation de l'énergie distribuée par les services publics	26
- normes	31
- limites de vitesse	1
- contrôle de l'approvisionnement aux heures de pointe	5
- contrôles environnementaux	3
<u>Considérations générales</u>	
- Équité des politiques (c'est-à-dire effets sur la distribution)	42

* Certaines études font partie de plus d'une catégorie.

** Certains programmes d'étiquetage sur la consommation d'énergie sont exigés par les gouvernements.

Table 8

Classification of Energy Studies by Attitude/Behaviour Measures Employed

Type of Measure	Study Code Numbers								
<u>Behaviour: (i) actual behaviour patterns</u>									
0015	0020	0025	0030	0035	0045	0050	0055	0060	0105
0435	0440	0445	0460	0475	0470	0505	0805	0815	0840
0850	0860	0865	0875	0910	0925	0930	0935	0940	1210
1215	1260	1270	1645	2025	2430	2810	2825	2860	2865
2870	2885	2895	2900	2905	2920	2925	4050	4435	4805
4850	4885	5225	5250	6005	6010	6015	6020	6030	6060
6880	7205	7210	7250	7275	7285	7290	7295	7325	7330
7335	7340	7350	7375	7390	7415	7635	8805	8820	8840
8845	8890	8895	8900	8905	8910	9810	9830		
(ii) self-reported									
0010	0065	0070	0075	0085	0090	0115	0120	0125	0405
0410	0415	0430	0435	0450	0455	0520	0525	0535	0540
0550	0555	0560	0565	0825	0835	0845	0855	0915	0920
0925	0950	0955	0960	0965	0970	1220	1240	1250	1255
1265	1615	1640	2005	2010	2030	2410	2415	2420	2435
2445	2450	2465	2470	2835	2840	2875	2880	2910	2965
2975	2980	2995	3630	4005	4015	4020	4030	4040	4080
4815	4865	4870	4875	4885	4910	4920	4940	4960	4965
4970	5005	5215	5235	5245	5250	5255	5620	5625	5650
5655	5660	5665	5670	5675	5685	5695	5730	5740	5745
6005	6020	6025	6040	6045	6050	6055	6080	6405	6410
6815	6820	6825	6830	6835	6840	6845	6875	7205	7225
7230	7255	7260	7265	7285	7290	7295	7300	7315	7320
7325	7330	7335	7340	7350	7355	7360	7370	7385	7400
7410	7605	7615	7625	8010	8015	8405	8410	8805	8815
8825	8830	8835	8845	8875	8880	8885	8925	9505	9805
(iii) behaviour intentions									
0010	0065	0090	0125	0425	0820	0865	0925	0930	0935
0940	0945	0955	0960	0965	0970	0975	1205	1260	1265
1280	1625	1640	2015	2040	2440	2465	2470	2810	2840
2845	2875	2880	2910	2985	4005	4015	4060	4895	4940
4960	4970	5205	5235	5245	5695	5720	5730	5740	6010
6015	6060	6065	6070	6090	6810	6825	6845	7230	7255
7270	7365	8015	8840	8845	8875	8880	8925		
<u>Attitudes Towards Energy Crisis: (i) belief/knowledge</u>									
0120	0420	0425	0540	0885	0890	0895	0900	0960	0965
1250	1280	2005	2040	2405	2440	2445	2450	2455	2830
2845	2910	3615	4030	4810	4865	4870	4895	4915	4920
4945	4955	4960	4965	4970	5000	5220	5255	5605	5620
5675	5710	5735	5755	6040	6825	6865	6875	6880	7240
7385	7605	7615	8825	8830	8835	8880	9815		

Tableau 8

Classification des études sur l'énergie selon les mesures employées
relativement aux attitudes et aux comportements

Type de mesure		Numéros de code des études							
Comportement : (i) comportements réels									
0015	0020	0025	0030	0035	0045	0050	0055	0060	0105
0435	0440	0445	0460	0475	0470	0505	0805	0815	0840
0850	0860	0865	0875	0910	0925	0930	0935	0940	1210
1215	1260	1270	1645	2025	2430	2810	2825	2860	2865
2870	2885	2895	2900	2905	2920	2925	4050	4435	4805
4850	4885	5225	5250	6005	6010	6015	6020	6030	6060
6880	7205	7210	7250	7275	7285	7290	7295	7325	7330
7335	7340	7350	7375	7390	7415	7635	8805	8820	8840
8845	8890	8895	8900	8905	8910	9810	9830		
(ii) comportements signalés par les consommateurs eux-mêmes									
0010	0065	0070	0075	0085	0090	0115	0120	0125	0405
0410	0415	0430	0435	0450	0455	0520	0525	0535	0540
0550	0555	0560	0565	0825	0835	0845	0855	0915	0920
0925	0950	0955	0960	0965	0970	1220	1240	1250	1255
1265	1615	1640	2005	2010	2030	2410	2415	2420	2435
2445	2450	2465	2470	2835	2840	2875	2880	2910	2965
2975	2980	2995	3630	4005	4015	4020	4030	4040	4080
4815	4865	4870	4875	4885	4910	4920	4940	4960	4965
4970	5005	5215	5235	5245	5250	5255	5620	5625	5650
5655	5660	5665	5670	5675	5685	5695	5730	5740	5745
6005	6020	6025	6040	6045	6050	6055	6080	6405	6410
6815	6820	6825	6830	6835	6840	6845	6875	7205	7225
7230	7255	7260	7265	7285	7290	7295	7300	7315	7320
7325	7330	7335	7340	7350	7355	7360	7370	7385	7400
7410	7605	7615	7625	8010	8015	8405	8410	8805	8815
8825	8830	8835	8845	8875	8880	8885	8925	9505	9805
iii) intentions de comportement									
0010	0065	0090	0125	0425	0820	0865	0925	0930	0935
0940	0945	0955	0960	0965	0970	0975	1205	1260	1265
1280	1625	1640	2015	2040	2440	2465	2470	2810	2840
2845	2875	2880	2910	2985	4005	4015	4060	4895	4940
4960	4970	5205	5235	5245	5695	5720	5730	5740	6010
6015	6060	6065	6070	6090	6810	6825	6845	7230	7255
7270	7365	8015	8840	8845	8875	8880	8925		

Table 8 (cont'd.)

Classification of Energy Studies by Attitude/Behaviour Measures Employed

Type of Measure	Study Code Numbers								
Attitudes Towards Energy Crisis (cont'd.): (ii) seriousness									
0405	0410	0415	0420	0425	0450	0495	0500	0540	0545
0565	0825	0830	0865	0885	0890	0895	0900	0960	0965
0970	1255	1280	1285	1290	2005	2045	2435	2440	2450
2455	2830	2845	2985	2990	3615	4055	4810	4865	4870
4890	5000	5005	5625	5640	5655	5660	5680	5710	6005
6055	6870	7295	7365	8015	8825	8880	9805		
(iii) causes/blame for									
0120	0425	0495	0500	0540	0545	0555	0895	0970	1285
2005	2440	2445	2450	3615	4870	4875	4895	5000	5005
5220	5255	5640	5645	5655	5755	6045	6050	6055	6815
6825	6860	6880	7240	7255	7605	7615	8830	8835	9805
(iv) individual's role in									
0410	0415	0420	0425	0445	0465	0565	0830	0845	0850
0865	0885	0890	0895	0900	0915	0920	0960	1205	1285
1290	1625	1640	2010	2015	2030	2405	2465	2470	2985
2995	3000	3615	4030	4455	4810	4815	4875	4890	4895
5005	5220	5235	5620	5645	5710	5735	6020	6840	7280
7295	7385	8410	8815	8860					
(v) government role in conservation (general)									
0120	0425	0495	0500	0540	0560	0825	0830	0845	0895
0975	1285	1290	1650	2010	2410	4810	4865	4920	4960
4965	4970	5605	5620	5640	6860	6895	7220	7265	7270
7365	8405	9815	9820	9825	9830				
(vi) specific government role									
0010	0065	0410	0450	0495	0500	0510	0515	0535	0540
0545	0555	0805	0835	0850	0900	0955	1240	1285	1620
2020	2045	2415	2420	2435	2455	2470	2830	2880	2990
4015	4050	4870	4875	4895	5220	5255	5635	5645	5650
5655	5660	5675	5680	5735	5750	5755	6070	6080	6405
6410	6820	6825	6855	6870	7205	7280	7310	8010	8420
8850									
(vii) utilities' role									
1220									
(viii) new technology									
0075	0115	0120	0480	0560	0565	0820	0835	1225	1275
1280	1290	2005	2405	2975	3625	4010	4420	4425	4430
4440	4445	4450	4815	4830	4835	4840	4890	5210	5255
5675	5770	6070	6090	6825	6875	6880	7240	7270	7295
7355	7420	7425	7610	8420					

Tableau 8 (suite)

Classification des études sur l'énergie selon les mesures employées
relativement aux attitudes et aux comportements

Type de mesure				Numéros de code des études					
Attitudes face à la crise de l'énergie : (i) croyance-connaissance									
0120	0420	0425	0540	0885	0890	0895	0900	0960	0965
1250	1280	2005	2040	2405	2440	2445	2450	2455	2830
2845	2910	3615	4030	4810	4865	4870	4895	4915	4920
4945	4955	4960	4965	4970	5000	5220	5255	5605	5620
5675	5710	5735	5755	6040	6825	6865	6875	6880	7240
7385	7605	7615	8825	8830	8835	8880	9815		
(ii) gravité									
0405	0410	0415	0420	0425	0450	0495	0500	0540	0545
0565	0825	0830	0865	0885	0890	0895	0900	0960	0965
0970	1255	1280	1285	1290	2005	2045	2435	2440	2450
2455	2830	2845	2985	2990	3615	4055	4810	4865	4870
4890	5000	5005	5625	5640	5655	5660	5680	5710	6005
6055	6870	7295	7365	8015	8825	8880	9805		
(iii) causes/responsables									
0120	0425	0495	0500	0540	0545	0555	0895	0970	1285
2005	2440	2445	2450	3615	4870	4875	4895	5000	5005
5220	5255	5640	5645	5655	5755	6045	6050	6055	6815
6825	6860	6880	7240	7255	7605	7615	8830	8835	9805
(iv) rôle de l'individu									
0410	0415	0420	0425	0445	0465	0565	0830	0845	0850
0865	0885	0890	0895	0900	0915	0920	0960	1205	1285
1290	1625	1640	2010	2015	2030	2405	2465	2470	2985
2995	3000	3615	4030	4455	4810	4815	4875	4890	4895
5005	5220	5235	5620	5645	5710	5735	6020	6840	7280
7295	7385	8410	8815	8860					
(v) rôle du gouvernement dans la conservation (en général)									
0120	0425	0495	0500	0540	0560	0825	0830	0845	0895
0975	1285	1290	1650	2010	2410	4810	4865	4920	4960
4965	4970	5605	5620	5640	6860	6895	7220	7265	7270
7365	8405	9815	9820	9825	9830				

Table 8 (cont'd.)

Classification of Energy Studies by Attitude/Behaviour Measures Employed

Type of Measure			Study Code Numbers							
<u>Attitudes Towards Energy Crisis (cont'd.): (ix) environment/quality of life</u>										
0075	0120	0425	0465	0515	0535	0545	0555	0840	0865	
0870	0915	0920	1230	1240	1275	1285	1290	1610	1620	
1650	2005	2015	2035	2040	2830	2965	2995	3000	3625	
4010	4025	4070	4420	4425	4430	4440	4445	4450	4810	
4835	4840	4890	4960	4965	4970	4985	5210	5665	5670	
5675	5680	5685	5690	5700	5715	5770	6025	6805	6810	
6815	6820	6825	6870	7235	7265	7420	7425	7610	8420	
(x) lifestyle										
0005	0915	0920	4030	4845	4890	5205	6055	6875	6880	
7240	7250	7295								

Tableau 8 (suite)

Classification des études sur l'énergie selon les mesures employées
relativement aux attitudes et aux comportements

Type de mesure				Numéros de code des études					
(vi) rôle spécifique du gouvernement									
0010	0065	0410	0450	0495	0500	0510	0515	0535	0540
0545	0555	0805	0835	0850	0900	0955	1240	1285	1620
2020	2045	2415	2420	2435	2455	2470	2830	2880	2990
4015	4050	4870	4875	4895	5220	5255	5635	5645	5650
5655	5660	5675	5680	5735	5750	5755	6070	6080	6405
6410	6820	6825	6855	6870	7205	7280	7310	8010	8420
8850									
(vii) rôle des services publics									
1220									
(viii) nouvelle technologie									
0075	0115	0120	0480	0560	0565	0820	0835	1225	1275
1280	1290	2005	2405	2975	3625	4010	4420	4425	4430
4440	4445	4450	4815	4830	4835	4840	4890	5210	5255
5675	5770	6070	6090	6825	6875	6880	7240	7270	7295
7355	7420	7425	7610	8420					
(ix) environnement/qualité de vie									
0075	0120	0525	0465	0515	0535	0545	0555	0840	0865
0870	0915	0920	1230	1240	1275	1285	1290	1610	1620
1650	2005	2015	2035	2040	2830	2965	2995	3000	3625
4010	4025	4070	4420	4425	4430	4440	4445	4450	4810
4835	4840	4890	4960	4965	4970	4985	5210	5665	5670
5675	5680	5685	5690	5700	5715	5770	6025	6805	6810
6815	6820	6825	6870	7235	7265	7420	7425	7610	8420
(x) mode de vie									
0005	0915	0920	4030	4845	4890	5205	6055	6875	6880
7240	7250	7295							

Table 9

Classification of Energy Studies by Energy Form

Energy Form		Study Code Numbers								
Nuclear energy										
0535	1225	1275	1620	1650	2005	2830	2970	4010	4830	
4835	4840	4890	5210	5770	7420	7425	7610	8915		
Solar energy										
0090	0480	0820	0835	0955	1650	2005	4815	6085	7280	
7355	8010	8820								
Electricity										
0015	0020	0025	0030	0035	0040	0045	0050	0055	0060	
0065	0070	0085	0095	0100	0105	0110	0410	0430	0435	
0440	0445	0460	0465	0475	0485	0490	0505	0510	0525	
0550	0560	0565	0850	0855	0860	0875	0880	0900	0905	
0910	0915	0920	0930	0935	0940	0950	0955	0965	1205	
1215	1220	1225	1235	1245	1250	1255	1285	1290	1610	
1615	1625	2005	2015	2030	2410	2435	2440	2460	2470	
2850	2855	2865	2870	2880	2890	2930	2935	2940	2945	
2950	3005	3010	3015	4035	4055	4075	4085	4410	4445	
4430	4435	4445	4450	4805	4810	4850	4855	4875	4880	
4925	4930	4935	4950	4975	4980	4990	4995	5005	5010	
5225	5230	5240	5250	5625	5635	5650	5670	5680	5745	
5760	5765	6005	6010	6015	6020	6025	6040	6045	6050	
6055	6075	6090	6405	6410	6415	6830	6840	6845	6860	
6885	6890	7230	7265	7280	7285	7290	7295	7315	7320	
7325	7330	7340	7350	7370	7415	7620	7625	7635	8410	
8805	8810	8825	8865	8885	8890	8895	8900	8905	8910	
8920										
Gasoline										
0060	0075	0125	0130	0405	0410	0415	0450	0455	0470	
0540	0545	0550	0560	0570	0805	0830	0915	0920	0925	
0955	0965	1205	1250	1260	1265	1270	1285	1290	1645	
2020	2025	2045	2415	2420	2810	2825	2835	2840	2900	
2910	2915	2920	2925	2990	2995	3000	3015	3605	3635	
4005	4015	4035	4050	4060	4065	4405	4875	4895	4910	
4940	5005	5215	5220	5635	5665	5680	5695	5705	5740	
6030	6040	6045	6050	6055	6060	6095	6810	6820	6825	
6835	6870	7205	7225	7310	7360	7365	7390	7400	7405	
7410	7625	7630	8015	8420	8870	8875				
Fuel oil										
0410	0430	0445	0920	1250	1255	1615	2005	2860	2875	
2930	2935	2940	2945	2950	3015	4035	4075	4085	5005	
5225	5240	5670	5745	6025	6040	6045	6050	6055	6830	
6840	6875	6880	7275	7625	8410	8420	8825	8865		

Tableau 9

Classification des études sur l'énergie selon la forme d'énergie

Forme d'énergie			Numéros de code des études						
Nucléaire									
0535	1225	1275	1620	1650	2005	2830	2970	4010	4830
4835	4840	4890	5210	5770	7420	7425	7610	8915	
Solaire									
0090	0480	0820	0835	0955	1650	2005	4815	6085	7280
7355	8010	8820							
Electricité									
0015	0020	0025	0030	0035	0040	0045	0050	0055	0060
0065	0070	0085	0095	0100	0105	0110	0410	0430	0435
0440	0445	0460	0465	0475	0485	0490	0505	0510	0525
0550	0560	0565	0850	0855	0860	0875	0880	0900	0905
0910	0915	0920	0930	0935	0940	0950	0955	0965	1205
1215	1220	1225	1235	245	1250	1255	1285	1290	1610
1615	1625	2005	2015	2030	2410	2435	2440	2460	2470
2850	2855	2865	2870	2880	2890	2930	2935	2940	2945
2950	3005	3010	3015	4035	4055	4075	4085	4410	4445
4430	4435	4445	4450	4805	4810	4850	4855	4875	4880
4925	4930	4935	4950	4975	4980	4990	4995	5005	5010
5225	5230	5240	5250	5625	5635	5650	5670	5680	5745
5760	5765	6005	6010	6015	6020	6025	6040	6045	6050
6055	6075	6090	6405	6410	6415	6830	6840	6845	6860
6885	6890	7230	7265	7280	7285	7290	7295	7315	7320
7325	7330	7340	7350	7370	7415	7620	7625	7635	8410
8805	8810	8825	8865	8885	8890	8895	8900	8905	8910
8920									
Essence									
0060	0075	0125	0130	0405	0410	0415	0450	0455	0470
0540	0545	0550	0560	0570	0805	0830	0915	0920	0925
0955	0965	1205	1250	1260	1265	1270	1285	1290	1645
2020	2025	2045	2415	2420	2810	2825	2835	2840	2900
2910	2915	2920	2925	2990	2995	3000	3015	3605	3635
4005	4015	4035	4050	4060	4065	4405	4875	4895	4910
4940	5005	5215	5220	5635	5665	5680	5695	5705	5740
6030	6040	6045	6050	6055	6060	6095	6810	6820	6825
6835	6870	7205	7225	7310	7360	7365	7390	7400	7405
7410	7625	7630	8015	8420	8870	8875			

Table 9 (cont'd.)

Classification of Energy Studies by Energy Form

Energy Form	Study Code Numbers									
Natural gas										
	0070	0410	0430	0445	0565	0810	0855	0915	0920	1235
	1245	1250	1255	1285	1290	1615	2005	2410	2415	2420
	2875	2930	2935	2940	2945	2950	3015	4035	4075	4085
	4980	5240	5670	5725	5735	5745	6005	6010	6015	6025
	6035	6405	6410	6415	6830	6840	7265	7325	7330	7335
	7340	7350	7620	7625	8410	8420	8865	8895		
Coal										
	0515	1645	4035	4410	4430	4445	4450			
Wood										
	0010									
Other										
	6035									
General										
	0120	0975	1210	1230	1240					

Tableau 9 (suite)

Classification des études sur l'énergie selon la forme d'énergie

Forme d'énergie			Numéros de code des études						
Mazout									
0410	0430	0445	0920	1250	1255	1615	2005	2860	2875
2930	2935	2940	2945	2950	3015	4035	4075	4085	5005
5225	5240	5670	5745	6025	6040	6045	6050	6055	6830
6840	6875	6880	7275	7625	8410	8420	8825	8865	
Gaz naturel									
0070	0410	0430	0445	0565	0810	0855	0915	0920	1235
1245	1250	1255	1285	1290	1615	2005	2410	2415	2420
2875	2930	2935	2940	2945	2950	3015	4035	4075	4085
4980	5240	5670	5725	5735	5745	6005	6010	6015	6025
6035	6405	6410	6415	6830	6840	7265	7325	7330	7335
7340	7350	7620	7625	8410	8420	8865	8895		
Charbon									
0515	1645	4035	4410	4430	4445	4450			
Bois									
0010									
Autre									
6035									
Général									
0120	0975	1210	1230	1240					

Table 10

Classification of Energy Studies by Activity Area

Energy Form		Study Code Numbers							
Home-Related: (i) space heating									
0010	0070	0090	0410	0430	0445	0465	0475	0480	0525
0560	0565	0810	0820	0830	0835	0850	0855	0875	0905
0910	0915	0920	0930	0935	0940	0955	0965	1235	1245
1255	1615	1625	2015	2030	2410	2415	2420	2430	2435
2460	2470	2815	2850	2860	2865	2870	2930	2935	2940
2945	2950	2960	3015	4055	4075	4415	4435	4810	4850
4980	4990	5225	5240	5625	5645	5650	5665	5735	5745
6005	6010	6015	6020	6035	6040	6045	6050	6055	6075
6080	6085	6090	6095	6410	6415	6810	6830	6840	6845
6875	6880	7265	7275	7315	7320	7325	7330	7335	7340
7350	7355	7370	7620	7625	8010	8410	8805	8825	8865
8885	8895	8900							
(ii) space cooling									
0440	0460	0465	0505	0525	0565	0820	0835	0860	0875
0915	0920	0930	0935	0940	0955	0965	1235	1245	1255
1615	1625	2015	2430	2435	2460	2470	2850	2855	2865
2870	2930	2935	2940	2945	2950	2960	3015	4055	4075
4415	4435	4810	4975	4980	5240	5250	5625	5650	5745
6005	6010	6015	6020	6090	6410	6415	6830	6840	6845
7230	7285	7290	7315	7320	7325	7330	7350	7370	7620
7625	8005	8865	8870	8900	8905	8910			
(iii) water heating									
0010	0090	0430	0445	0460	0465	0480	0525	0875	0920
0930	0935	0940	0955	0965	1235	1245	1255	1615	1625
2015	2430	2425	2460	2470	2850	2865	2870	2940	4055
4075	4415	4435	4810	4815	4980	4990	5240	5250	5625
5650	5735	6005	6010	6015	6020	6090	6405	6410	6415
6825	6840	6845	7325	7330	7335	7340	7350	7370	7620
8010	8410	8805	8820	8885	8895				
(iv) appliances									
0075	0085	0435	0440	0445	0460	0465	0475	0485	0490
0525	0550	0560	0565	0850	0855	0860	0875	0880	0900
0905	0910	0915	0920	0930	0935	0940	0955	0965	1205
1220	1235	1245	1255	1615	1625	2015	2430	2435	2440
2460	2470	2815	2850	2855	2865	2870	2880	2890	2935
2940	2945	2950	2960	3005	3010	3015	4055	4075	4415
4435	4810	4850	4875	4880	4980	4990	5240	5250	5625
5650	5680	5745	5760	5765	6005	6010	6015	6020	6040
6045	6050	6055	6090	6405	6410	6415	6840	6845	6885
7285	7290	7295	7315	7320	7325	7330	7340	7350	7370
7620	7625	7635	8410	8805	8825	8885	8890	8895	8900
8910	8920								

Tableau 10

Classification des études sur l'énergie selon les secteurs d'activité

Forme d'énergie									
Numéros de code des études									
Maison : (i) chauffage									
0010	0070	0090	0410	0430	0445	0465	0475	0480	0525
0560	0565	0810	0820	0830	0835	0850	0855	0875	0905
0910	0915	0920	0930	0935	0940	0955	0965	1235	1245
1255	1615	1625	2015	2030	2410	2415	2420	2430	2435
2460	2470	2815	2850	2860	2865	2870	2930	2935	2940
2945	2950	2960	3015	4055	4075	4415	4435	4810	4850
4980	4990	5225	5240	5625	5645	5650	5665	5735	5745
6005	6010	6015	6020	6035	6040	6045	6050	6055	6075
6080	6085	6090	6095	6410	6415	6810	6830	6840	6845
6875	6880	7265	7275	7315	7320	7325	7330	7335	7340
7350	7355	7370	7620	7625	8010	8410	8805	8825	8865
8885	8895	8900							
(ii) climatisation									
0440	0460	0465	0505	0525	0565	0820	0835	0860	0875
0915	0920	0930	0935	0940	0955	0965	1235	1245	1255
1615	1625	2015	2430	2435	2460	2470	2850	2855	2865
2870	2930	2935	2940	2945	2950	2960	3015	4055	4075
4415	4435	4810	4975	4980	5240	5250	5625	5650	5745
6005	6010	6015	6020	6090	6410	6415	6830	6840	6845
7230	7285	7290	7315	7320	7325	7330	7350	7370	7620
7625	8005	8865	8870	8900	8905	8910			
(iii) eau chaude									
0010	0090	0430	0445	0460	0465	0480	0525	0875	0920
0930	0935	0940	0955	0965	1235	1245	1255	1615	1625
2015	2430	2425	2460	2470	2850	2865	2870	2940	4055
4075	4415	4435	4810	4815	4980	4990	5240	5250	5625
5650	5735	6005	6010	6015	6020	6090	6405	6410	6415
6825	6840	6845	7325	7330	7335	7340	7350	7370	7620
8010	8410	8805	8820	8885	8895				

Table 10 (cont'd.)

Classification of Energy Studies by Activity Area

Energy Form	Study Code Numbers									
<u>Home-Related (cont'd.):</u> (v) general home										
0015	0020	0025	0030	0035	0040	0045	0050	0055	0065	
0095	0105	0110	0115	0120	0815	0840	0885	0890	0895	
0950	0960	0975	1210	1230	1240	1250	1290	2950	2965	
2985	4080	4925	4930	4935	4950	4975	4995	5005	5230	
5635	6025	6890	7280	8810	8890					
(vi) retrofitting										
0010	0090	0480	0835	0910	0955	1210	2410	2415	2420	
2815	2860	2930	2945	2950	2960	4075	4960	4970	5205	
5625	5680	5685	6080	6095	6830	7620	7625			
(vii) home audits										
1650	4885	6005	7620							
<u>Transportation-Related:</u> (i) public transportation										
0455	0470	0550	0805	0830	2825	2835	2840	2910	2920	
4015	4060	4405	4910	5215	5220	5690	5695	6060	6870	
(ii) car/van pools										
0060	0130	0470	0805	0815	1260	1265	1270	1645	2810	
2840	2915	2995	3605	3635	4015	4045	4050	4910	5640	
6030	6060	7625	7630							
(iii) private automobile										
0075	0125	0130	0405	0410	0415	0450	0455	0470	0540	
0545	0550	0560	0570	0805	0830	0915	0920	0925	0955	
0965	0975	1240	1250	1645	2025	2045	2825	2835	2840	
2885	2900	2910	2915	2920	2925	2990	2995	3000	3015	
4005	4015	4060	4065	4405	4875	4895	4910	4940	5005	
5215	5220	5635	5665	5695	5705	5740	6040	6045	6050	
6055	6060	6095	6810	6820	6825	6835	6870	7205	7225	
7310	7360	7365	7390	7400	7405	7410	7625	7630	8015	
8870	8875	8880								
(iv) vacation/leisure										
2840	4910	4940	5695	8015	8880					

Tableau 10 (suite)

Classification des études sur l'énergie selon les secteurs d'activité

Forme d'énergie				Numéros de code des études					
(iv) appareils ménagers									
0075	0085	0435	0440	0445	0460	0465	0475	0485	0490
0525	0550	0560	0565	0850	0855	0860	0875	0880	0900
0905	0910	0915	0920	0930	0935	0940	0955	0965	1205
1220	1235	1245	1255	1615	1625	2015	2430	2435	2440
2460	2470	2815	2850	2855	2865	2870	2880	2890	2935
2940	2945	2950	2960	3005	3010	3015	4055	4075	4415
4435	4810	4850	4875	4880	4980	4990	5240	5250	5625
5650	5680	5745	5760	5765	6005	6010	6015	6020	6040
6045	6050	6055	6090	6405	6410	6415	6840	6845	6885
7285	7290	7295	7315	7320	7325	7330	7340	7350	7370
7620	7625	7635	8410	8805	8825	8885	8890	8895	8900
8910	8920								
(v) habitation en général									
0015	0020	0025	0030	0035	0040	0045	0050	0055	0065
0095	0105	0110	0115	0120	0815	0840	0885	0890	0895
0950	0960	0975	1210	1230	1240	1250	1290	2950	2965
2985	4080	4925	4930	4935	4950	4975	4995	5005	5230
5635	6025	6890	7280	8810	8890				
(vi) transformations									
0010	0090	0480	0835	0910	0955	1210	2410	2415	2420
2815	2860	2930	2945	2950	2960	4075	4960	4970	5205
5625	5680	5685	6080	6095	6830	7620	7625		
(vii) vérifications									
1650	4885	6006	7620						
Transport : (i) transports en commun									
0455	0470	0550	0805	0830	2825	2835	2840	2910	2920
4015	4060	4405	4910	5215	5220	5690	5695	6060	6870
(ii) transport coopératif en voiture ou en camionnette									
0060	0130	0470	0805	0815	1260	1265	1270	1645	2810
2840	2915	2995	3605	3635	4015	4045	4050	4910	5640
6030	6060	7625	7630						

Table 10 (cont'd.)

Classification of Energy Studies by Activity Area

Energy Form		Study Code Numbers							
<u>General:</u>									
	0005	1630	1640	2005	2010	2040	2405	2440	2445 2450
	4020	4030	4035	4040	4080	4455	4820	4825	4845 4865
	4870	4915	4920	4945	4955	4960	4965	4970	5010 5205
	5235	5245	5255	5615	5620	5630	5640	5655	5660 5675
	5700	5710	5720	5730	5750	5755	6065	6070	6815 6850
	7210	7215	7220	7240	7255	7260	7270	7300	7305 7345
	7375	7380	7385	7395	7415	7605	7615	7640	8405 8415
	8420	8815	8830	8835	8840	8845	8850	8860	8925 9505
	9510	9805	9810	9815	9820	9825	9830		
<u>Commercial Sector:</u>									
	1215	2955	3630	6850					

Tableau 10 (suite)

Classification des études sur l'énergie selon les secteurs d'activité

Forme d'énergie			Numéros de code des études						
(iii) voiture									
0075	0125	0130	0405	0410	0415	0450	0455	0470	0540
0545	0550	0560	0570	0805	0830	0915	0920	0925	0955
0965	0975	1240	1250	1645	2025	2045	2825	2835	2840
2885	2900	2910	2915	2920	2925	2990	2995	3000	3015
4005	4015	4060	4065	4405	4875	4895	4910	4940	5005
5215	5220	5635	5665	5695	5705	5740	6040	6045	6050
6055	6060	6095	6810	6820	6825	6835	6870	7205	7225
7310	7360	7365	7390	7400	7405	7410	7625	7630	8015
8870	8875	8880							
(iv) vacances/loisirs									
2840	4910	4940	5695	8015	8880				
<u>En général :</u>									
0005	1630	1640	2005	2010	2040	2405	2440	2445	2450
4020	4030	4035	4040	4080	4455	4820	4825	4845	4865
4870	4915	4920	4945	4955	4960	4965	4970	5010	5205
5235	5245	5255	5615	5620	5630	5640	5655	5660	5675
5700	5710	5720	5730	5750	5755	6065	6070	6815	6850
7210	7215	7220	7240	7255	7260	7270	7300	7305	7345
7375	7380	7385	7395	7415	7605	7615	7640	8405	8415
8420	8815	8830	8835	8840	8845	8850	8860	8925	9505
9510	9805	9810	9815	9820	9825	9830			
<u>Secteur commercial :</u>									
1215	2955	3630	6850						

Table 11

Classification of Energy Studies by Policy Type

Policy Type	Study Code Numbers									
<u>Financial-Persuasive: (i) general information</u>										
0525										
(ii) voluntary efforts										
0885	0890	0895	4865	4920						
(iii) tax credits										
0010	0095	0100	0835	0955	1205	1230	1235	1245	1285	
1630	1650	2005	2405	2460	2805	2815	2865	2905	2915	
5755	6080	6405	6410	6415	6830	7380	9505			
(iv) rebates										
0440	2025	4020	4055	4405	4850	4855	4915	5220	5550	
5555	5630	5680	5700	7240	7335	7340	8805	8895	8900	
8905										
<u>Financial-Regulatory: (i) general policy</u>										
0565	0825	1285	3000	3625	4920					
(ii) time of day pricing										
0015	0020	0025	0065	0435	0505	2015	2435	4805	4810	
4925	4930	4935	4990	5010	5645	7280				
(iii) price changes/surcharges										
0030	0110	0405	0445	0450	0485	0490	0520	0525	0540	
0545	0550	0555	0570	0810	0830	0870	0875	0925	0955	
0970	0975	1230	1235	1245	1250	1285	1610	1625	2005	
2045	2415	2420	2835	2840	2885	2905	2915	2930	2935	
2940	2950	2955	2960	2990	4005	4015	4035	4060	4065	
4085	4415	4810	4820	4870	4875	4895	4900	4905	4940	
4945	4950	4980	4990	4995	5010	5215	5225	5630	5635	
5645	5650	5665	5675	5680	5700	5705	6045	6050	6055	
6065	6070	6090	6405	6410	6825	6835	6845	6860	6870	
6885	6895	7215	7225	7300	7375	7380	7395	7400	7405	
7415	8015	8420	8810	8870	8875	8880				
<u>Non-Financial-Persuasive: (i) general information</u>										
0015	0420	0425	0815	0910	0945	2040	2865	2935	2975	
2980	4055	4915	4945	4990	5630	8890	8895	8900	8905	

Tableau 11

Classification des études sur l'énergie
selon le type de politique

Type de politique		Numéros de code des études							
<u>Avec mesures financières - Persuasion : (i) information générale</u>									
0525									
(ii) efforts spontanés									
0885	0890	0895	4865	4920					
(iii) crédits d'impôt									
0010	0095	0100	0835	0955	1205	1230	1235	1245	1285
1630	1650	2005	2405	2460	2805	2815	2865	2905	2915
5755	6080	6405	6410	6415	6830	7380	9505		
(iv) remises									
0440	2025	4020	4055	4405	4850	4855	4915	5220	5550
5555	5630	5680	5700	7240	7335	7340	8805	8895	8900
8905									
<u>Avec mesures financières - Réglementation : (i) politique générale</u>									
0565	0825	1285	3000	3625	4920				
(ii) fixation des prix selon le moment de la journée									
0015	0020	0025	0065	0435	0505	2015	2435	4805	4810
4925	4930	4935	4990	5010	5645	7280			
(iii) surtaxes/changements de prix									
0030	0110	0405	0445	0450	0485	0490	0520	0525	0540
0545	0550	0555	0570	0810	0830	0870	0875	0925	0955
0970	0975	1230	1235	1245	1250	1285	1610	1625	2005
2045	2415	2420	2835	2840	2885	2905	2915	2930	2935
2940	2950	2955	2960	2990	4005	4015	4035	4060	4065
4085	4415	4810	4820	4870	4875	4895	4900	4905	4940
4945	4950	4980	4990	4995	5010	5215	5225	5630	5635
5645	5650	5665	5675	5680	5700	5705	6045	6050	6055
6065	6070	6090	6405	6410	6825	6835	6845	6860	6870
6885	6895	7215	7225	7300	7375	7380	7395	7400	7405
7415	8015	8420	8810	8870	8875	8880			

Table 11 (cont'd.)

Classification of Energy Studies by Policy Type

Policy Type	Study Code Numbers									
<u>Non-Financial-Persuasive (cont'd.): (ii) government information</u>										
	0085	0130	0440	0530	0830	0835	0975	1235	1285	1630
	1635	2020	2445	2815	2845	2855	2860	2945	2950	2955
	2960	2985	2995	3610	4020	4815	4825	4860	4895	5005
	5205	5630	5670	5675	5685	5735	5745	5750	5755	6405
	6415	6805	6820	6865	6875	7205	7240	7255	8410	8415
	8420	8825	8850	8865	9805					
(iii) energy labelling										
	0850	0880	0900	1220	1235	1245	1630	3005	3010	4880
	4990	5760	5765	6885	7205	8920				
(iv) utility information										
	0930	0935	0940	1215	1225	2015	5605	5625	6005	6845
	7620									
(v) consumption feedback										
	0440	0460	0465	0505	0830	0860	1630	2865	3610	4055
	4825	4850	4855	4915	4945	6010	6020	6845	6890	7230
	7240	7275	7285	7290	7335	7340	7350	8900	8905	8910
	8930									
(vi) voluntary efforts										
	0470	0805	0885	0890	0895	1260	1265	1270	1645	1650
	2020	2030	2440	2810	4045	4050	4865	4885	4920	4950
	4975	5620	5625	6005	6035	6090	6095	6865	7240	7630
	9025									
<u>Non-Financial-Regulatory: (i) general policy</u>										
	0565	0825	0870	1285	2830	3000	3625	4920		
(ii) rationing										
	0015	0040	0450	0495	0540	0925	1230	1235	1245	1625
	2015	2045	2835	2840	4005	4015	4810	4870	4875	4895
	4940	5215	5635	5665	5670	5675	6060	6070	6090	6825
	6870	7230	7300	7310	7375	7380	8420	8870	9815	9820
(iii) utility load control										
	0015	0020	0025	0035	0040	0045	0050	0065	0095	0100
	0105	0435	0875	1625	2470	4055	4435	4805	4810	4925
	4930	4935	5010	6090	7280	7415				

Tableau 11 (suite)

Classification des études sur l'énergie
selon le type de politique

Type de politique					Numéros de code des études				
<u>Sans mesures financières - Persuasion : (i) information générale</u>									
0015	0420	0425	0815	0910	0945	2040	2865	2935	2975
2980	4055	4915	4945	4990	5630	8890	8895	8900	8905
(ii) information gouvernementale									
0085	0130	0440	0530	0830	0835	0975	1235	1285	1630
1635	2020	2445	2815	2845	2855	2860	2945	2950	2955
2960	2985	2995	3610	4020	4815	4825	4860	4895	5005
5205	5630	5670	5675	5685	5735	5745	5750	5755	6405
6415	6805	6820	6865	6875	7205	7240	7255	8410	8415
8420	8825	8850	8865	9805					
(iii) étiquetage de la consommation d'énergie									
0850	0880	0900	1220	1235	1245	1630	3005	3010	4880
4990	5760	5765	6885	7205	8920				
(iv) information des services publics									
0930	0935	0940	1215	1225	2015	5605	5625	6005	6845
7620									
(v) réactions sur la consommation									
0440	0460	0465	0505	0830	0860	1630	2865	3610	4055
4825	4850	4855	4915	4945	6010	6020	6845	6890	7230
7240	7275	7285	7290	7335	7340	7350	8900	8905	8910
8930									
(vi) efforts spontanés									
0470	0805	0885	0890	0895	1260	1265	1270	1645	1650
2020	2030	2440	2810	4045	4050	4865	4885	4920	4950
4975	5620	5625	6005	6035	6090	6095	6865	7240	7630
9025									
<u>Sans mesures financières - Réglementation : (i) politique générale</u>									
0565	0825	0870	1285	2830	3000	3625	4920		

Table 11 (cont'd.)

Classification of Energy Studies by Policy Type

Policy Type	Study Code Numbers									
<u>Non-Financial-Regulatory (cont'd.): (iv) standards</u>										
	0085	1235	1245	2805	2815	2835	2855	2860	2890	2910
	2915	2930	2935	2940	2945	2950	2960	4075	4405	4875
	4980	4990	5665	6095	6405	6410	6415	7280	7405	8870
	8920									
(v) speed limits										
	0130									
(vi) bulk metering										
	0475	2460	4855	5220	5230					
(vii) environmental controls										
	0515	0535	0545							
<u>General Considerations: - equity of policy (i.e., distributional effects)</u>										
	0005	0495	0520	0855	2460	2805	2835	2885	2895	2905
	4035	4040	4435	4820	4945	4985	4995	5010	5215	5220
	5235	5245	5630	5700	6040	6050	6055	6080	7220	7260
	7300	7310	7365	7375	7395	7400	7405	7410	8810	8820
	8885	9825								

Tableau 11 (suite)

Classification des études sur l'énergie
selon le type de politique

Type de politique		Numéros de code des études							
(ii) rationnement									
0015	0040	0450	0495	0540	0925	1230	1235	1245	1625
2015	2045	2835	2840	4005	4015	4810	4870	4875	4895
4940	5215	5635	5665	5670	5675	6060	6070	6090	6825
6870	7230	7300	7310	7375	7380	8420	8870	9815	9820
(iii) contrôle de la consommation de l'énergie distribuée par les services publics									
0015	0020	0025	0035	0040	0045	0050	0065	0095	0100
0105	0435	0875	1625	2470	4055	4435	4805	4810	4925
4930	4935	5010	6090	7280	7415				
(iv) normes									
0085	1235	1245	2805	2815	2835	2855	2860	2890	2910
2915	2930	2935	2940	2945	2950	2960	4075	4405	4875
4980	4990	5665	6095	6405	6410	6415	7280	7405	8870
8920									
(v) limites de vitesse									
0130									
(vi) contrôle de l'approvisionnement aux heures de pointe									
0475	2460	4855	5220	5230					
(vii) contrôles environnementaux									
0515	0535	0545							
<u>Considérations d'ordre général</u>		<u>- équité des politiques (c'est-à-dire effets sur la distribution)</u>							
0005	0495	0520	0855	2460	2805	2835	2885	2895	2905
4035	4040	4435	4820	4845	4985	4995	5010	5215	5220
5235	5245	5630	5700	6040	6050	6055	6080	7220	7260
7300	7310	7365	7375	7395	7400	7405	7410	8810	8820
8885	9825								

Table 12/Tableau 12

Journals Referenced in Bibliography/
Périodiques mentionnés dans la bibliographie

American Economic Review
American Journal of Community Psychology
Applied Social Psychology Annual
Arizona Business Review
Ball State Business Review
Bell Journal of Economics
Bulletin of the Atomic Scientists
California Agriculture
Ecology Modelling
Energy Communication
Energy Policy
Energy Systems and Policy
Environment
Environment and Behavior
Family Economics Review
Forensic Quarterly
Human Ecology
Industrialization Forum
International Journal of Comparative Sociology
Journal of Applied Psychology
Journal of Business Research
Journal of Consumer Affairs
Journal of Consumer Research
Journal of Energy and Development
Journal of Engineering and Power
Journal of Environmental Education
Journal of Environmental Systems
Journal of Home Economics
Journal of Marketing
Journal of Personality and Social Psychology
Journal of Property Management
Journal of the Marketing Research Society
Journal of Social Psychology
Journal of Travel Research
Land Economics
Mechanical Engineer
Monthly Labor Review
Personality and Social Psychology Bulletin
Policy Analysis
Public Opinion Quarterly
Public Utilities Fortnightly
Review of Economics and Statistics
Science
Science and Public Affairs
Scientific American
Simulation

Table/Tableau 12 (cont'd/suite)

Journals Referenced in Bibliography/
Périodiques mentionnés dans la bibliographie

Social Forces
Social Science Quarterly
Survey of Business
The Professional Geographer
Tijdschrift Voor Economische en Sociale Geographie
Traffic Quarterly

Table 13

Conference Proceedings Referenced in Bibliography

Published Proceedings:

Administrative Sciences Association of Canada
American Institute of Decision Sciences
American Marketing Association
Association for Consumer Research
Institute of Electrical and Electronic Engineers

Unpublished Proceedings:

Allied Social Science Association
American Social Science Association
Canadian Association of Applied Social Research
ORSA/TIMS
Regional Science Association
Rural Sociological Society
Society for the Study of Social Problems
Southern Marketing Association

Tableau 13

Comptes rendus de conférences mentionnés dans la bibliographie

Comptes rendus publiés

Association canadienne des sciences administratives
American Institute of Decision Sciences
American Marketing Association
Association for Consumer Research
Institute of Electrical and Electronic Engineers

Comptes rendus non publiés

Allied Social Science Association
American Social Science Association
Canadian Association of Applied Social Research
ORSA/TIMS
Regional Science Association
Rural Sociological Society
Society for the Study of Social Problems
Southern Marketing Association

Table 14

Other Sources Referenced in Bibliography

Government: various governments and departments within governments including;

Bureau of Social Research
Consumer and Corporate Affairs Canada
Energy, Mines, and Resources Canada
State Energy Offices
U.S. Department of Energy
U.S. Federal Energy Administration
U.S. Department of Health, Education and Welfare

Universities: various published and unpublished reports from universities including;

Center for Energy Studies, University of Texas at Austin
Centre for Energy and Environmental Studies, Princeton University
Energy Institute, University of Houston
Institute of Policy Analysis, University of Toronto
Social Research Center, Washington University
Stanford Research Institute, Stanford University
Transportation Centre, University of Tennessee

Private Sector/Other:

Consumers' associations
Electrical associations
Ford Foundation
Institute for Research on Public Policy
Marketing research firms
National Technical Information Service
Oak Ridge National Laboratory
Rand Corporation
Solar Energy Research Institute

Tableau 14

Autres sources mentionnées dans la bibliographie

Gouvernement : divers gouvernements et ministères gouvernementaux, y compris les suivants :

Bureau of Social Research (Bureau de recherches sociales)
Consommation et Corporations Canada
Énergie, Mines et Ressources Canada
State Energy Offices (Bureau de l'énergie de divers États)
U.S. Department of Energy (Département de l'Énergie des États-Unis)
U.S. Federal Energy Administration (Administration fédérale des affaires énergétiques des États-Unis)
U.S. Department of Health, Education and Welfare (Département de la Santé, de l'Éducation et du Bien-être social des États-Unis)

Universités : divers rapports publiés et non publiés par les universités, y compris les suivants :

Center for Energy Studies (Centre d'études sur l'énergie), université du Texas à Austin
Center for Energy and Environmental Studies (Centre d'études sur l'énergie et l'environnement), université Princeton
Energy Institute of Policy Analysis (Institut d'analyses de politiques), université de Toronto
Social Research Center (Centre de recherches sociales), université de Washington
Stanford Research Institute (Institut de recherches de Stanford), université de Stanford
Transportation Centre (Centre des transports), université du Tennessee

Secteur privé/autres :

Associations de consommateurs
Associations dans le domaine de l'électricité
Fondation Ford
Institut de recherches politiques
Entreprises de recherches en marketing
National Technical Information Service (Service d'information technique nationale)
Oak Ridge National Laboratory (Laboratoire national d'Oak Ridge)
Rand Corporation
Solar Energy Research Institute (Institut de recherches sur l'énergie solaire)

BIBLIOGRAPHY / BIBLIOGRAPHIE

Abt, Clark C.

1977 Energy Shortages and Changing Lifestyles.

Technological Forecasting & Social Changes, 10, 2, 113-120.

Abstract: The degree and scope of lifestyle changes during a period of energy shortages is necessarily a function of the degree and rate of increase of the attendant crisis. If the shortage is large, more lifestyle changes will be required than if it is small. If a large energy shortage occurs very suddenly, the impact on lifestyle will be more pervasive than if the same amount of shortage develops gradually and allows enough time for compensating adjustments. Concretely, the net effect of energy shortages on marginal groups, such as the poor and the aged, is characterized by an adverse turn in the health and longevity of the two groups.

0010

Action Research Inc.

1978 Final Report On the Use of Wood as a Heat Source and the Quality of Insulation in Vermont Households.
Prepared for the State of Vermont Energy Office.

Objective: To measure wood use and perceived insulation quality, and the changes in those two variables since 1976

Method: A telephone survey of 628 Vermont residents was conducted in January and February 1978.

Variables: Dependent: wood use; type of wood burning device; proportion of heat derived from wood; source and type of wood used; type, number and uses of wood stoves; intention to buy wood stove; presence of insulation and its thickness and quality; awareness of insulation type; improvements in insulation and intentions to improve; attitudes toward insulation tax credit; use of storm windows, storm doors, weatherstripping, etc.

Independent: demographics, dwelling description

Findings/implications: The use of wood increased considerably since 1976 (67% of homeowners burn wood vs. 50% in 1976). In those households, wood accounted for 41% of total heat (vs. 26% in 1976). Wood users in general tended to be of various ages, from households with \$10,000 or more in income, college educated and from larger households. The use of wood stoves also increased, from 31% in 1976 to 42% in 1978. Most of the homeowners (nearly 90%) claim that their homes are insulated and 75% claim that their insulation is more than adequate. About 25% improved their insulation over the previous three years. Those making improvements tended to be from households with an income of \$10,000 to \$19,999, college educated, and from households with two to four family members. Older homes are less likely to be insulated. Few (10%) of the homeowners whose homes are not insulated intend to insulate them within the next three years. An insulation tax credit is favoured by a majority (75%) of Vermont residents.

Acton, J.P.

1976 The Move Towards Marginal Cost Pricing in Electricity.
 (Publication No. P-5673)
 Santa Monica, Ca.: The Rand Corporation.

Abstract: This report discusses the feasibility of using marginal cost pricing for electricity rates. Present rate structures charge less per unit as the customer consumes more. Since these structures were established, there have been dramatic increases in the amount of electricity consumed, as well as changes in patterns of use. Beginning in 1965, utilities began to encounter increases in capital and operating expenses. There are also long-term environmental and conservation reasons for changing the present rate structure. Rates based on the marginal cost are appropriate and have been shown in Europe to be administratively feasible. A residential experiment conducted by the Los Angeles Department of Water and Power and the Rand Corporation using 2,000 households is described. Reaction to a variety of experimental rates will be measured to observe the number of kilowatt hours consumed, changes in consumption during peak and off-peak periods, and the impact of these rates on consumption of natural gas.

Acton, J.P.

1977 Electric Ratemaking -- An Overview.
 (Publication No. P-5894)
 Santa Monica, Ca.: The Rand Corporation.

Abstract: This report comprises an overview of findings from recent Rand research on electricity rate structures. Accurate pricing of electricity can help to conserve important resources. Such prices will reflect the true cost of providing the service. This requires peak-load or time-of-day rates that reflect the daily and seasonal variations in the cost of generation and supply. Some significant findings are that: (1) U.S. industry can respond to peak-load pricing of electricity, thereby lowering its own electricity bill as well as the operating cost of the utility companies; (2) the expected savings to U.S. utilities from peak-load pricing are significant; (3) the response of residential and small commercial customers to peak-load pricing is uncertain and additional information is needed before such a policy is implemented; and (4) peak-load pricing of electricity will require equipment and administrative changes, but is not more difficult to implement and administer than traditional rate structures.

Acton, J.P.

1979 Testimony Before the Ontario Energy Board. Prepared Evidence.
 (Publication No. P-6289)
 Santa Monica, Ca.: The Rand Corporation.

Abstract: This report deals with the evidence submitted in January 1979 to the Ontario Energy Board, prepared for the Public Interest Advocacy Center on behalf of the National Anti-poverty Organization of Canada. The author argues that marginal cost pricing of electricity is feasible, would provide a sound basis for ratemaking, and would promote economic efficiency, fairness and financial adequacy. There is abundant evidence that electricity customers can adjust satisfactorily to time-of-day electricity rates, and that these adjustments are beneficial to both the utility and customers in achieving lower electricity bills. Time-of-day rates give customers opportunities for cost saving that conventional rates do not. In many cases, it increases the competitive advantage of industrial customers to have time-of-day rates available. The line management proposal to create a "diversity benefit" subsidy and to apply it selectively to certain large customers constitutes discrimination in rate-making not based on differences in costs of supply.

0030

Acton, Jan Paul, M.H. Graubard and D.J. Weinshroft

1974 Electricity Conservation Measures in the Commercial Sector: The Los Angeles Experiment.

(Publication No. R-1592-FEA)

Santa Monica, Ca.: The Rand Corporation.

Objective: To determine some of the reasons for the especially successful adaptation of the ordinance (The Emergency Energy Curtailment Plan of the City of Los Angeles) to reduce consumption by 10 to 20% in the first phase and 12 to 33% in the second. A failure to comply with the ordinance resulted in a 50% surcharge.

Method: Extensive contacts were made with people involved in all aspects of energy conservation procedures to provide an overview of the situation, the problems and the successes. Also, a target population of 35 establishments was contacted for further input on ability to comply with the ordinance.

Variables: The measures utilized by commercial consumers to reduce consumption and comply with the ordinance.

Findings/implications: Despite some confusion and disruption, compliance with the ordinance was characterized by widespread public cooperation. One of the major measures used by virtually everyone was to reduce the use of lighting which, in turn, decreased consumption by 20% in most cases. With severe dislocation and was perceived as a viable goal. Selective backsliding did occur, although the rate increases have not underscored the desirability of using less electricity. Large commercial customers found it advantageous to go beyond lighting and look at scheduling and equipment use. Almost no one had prepared any type of standby plan should another energy crisis hit the area. Most commercial establishments relied upon the Department of Water and Power to monitor their meters and set the allowable consumption rate. Measures were quickly conceived, and the time and cost involved for implementation were relatively minor.

The plan is generally transferable to other sectors, with certain adjustments. The fact that city council acted swiftly and that the response was generally positive gives certain credibility for future activities that may function similarly to the ordinance. The savings in the commercial field were relatively high, and projections for the residential sector yield a possible 30% reduction.

Acton, J.P., Mitchell, B.M., and R. Sohlberg

1978 Estimating Residential Electricity Demand Under Declaring-Block
 Tariffs: An Econometric Study Using Micro-Data.
 (Publication No. P-6203)
 Santa Monica, Ca.: The Rand Corporation.

Abstract: Declining block rates for electricity may cause a bias in empirical investigations of demand because the marginal price per unit of electricity is not constant. This study was able to measure the marginal price faced by households, control for eight major appliances and take account of weather variations by adopting a disaggregated approach to estimating demand equations. It is based on micro-level data for 3,825 geographic areas in Los Angeles County. Own-price elasticities of demand range from $-.35$ in two-year pooled samples of cross-sections to $-.70$ in cross-sections for a single billing period. Income elasticities of demand are approximately $.40$. Natural gas has a crossprice elasticity of $.75$ to $.90$. In the long run, changes in major variables will alter the stock of appliances as well as utilization patterns and result in larger elasticities than estimated by this study. These improved empirical estimates permit richer and more accurate policy analysis of rate changes.

0040

Acton, Jan Paul, and Ragnhild Mowill

1976 Regulatory Rationing of Electricity Under a Supply Curtailment.
Land Economics Vol. 52, #4 (November), 493-508.

Objective: To study the nature of the Los Angeles Plan, its immediate and long-term effects on electricity consumption, and the desirability of such an approach in another crisis

Method: The impact of the ordinance and accompanying factors on total energy consumption was analyzed by means of: (1) a year-by-year comparison of monthly electricity production and sales; (2) a comparison of the adjusted effects of weather, price, economic activity and minutes of daylight for expected and observed results; and (3) year-by-year changes of the Department of Water and Power with three other California utility companies.

Variables: Dependent: consumption, sales

Independent: time, company, end use classes, price, economic activities, temperatures, daylight

Findings/implications: All classes of consumers met and exceeded the required amount of reductions as entailed in the first phase of the plan. Generally, sales and consumption levels were well below the 1973 levels. The main reasons for the reductions were changes in the usage of lighting systems. When the estimated data were compared to the observed behaviour for the period December 1970 to August 1973, energy prices and economic activity had positive effects on consumption. When the Department of Water and Power (DWP) was compared to the three other companies, it produced significant reductions overall, except for the commercial sector in terms of sales. However, in actual energy consumption, DWP produced reductions of 15 to 20% as compared to the other utility companies. The ordinance proved very successful in reducing consumption through the provision of economic disincentives for failure to comply. The implication here is that either price increases or economic incentives are viable measures to cause reductions in consumption.

The plan is generally transferable to other sectors, with certain adjustments. The fact that city council acted swiftly and that the response was generally positive gives certain credibility for future activities that may function similarly to the ordinance. The savings in the commercial field were relatively high, and projections for the residential sector yield a possible 30% reduction.

Acton, Jan Paul, Mitchell, Bridger M., and Willard G. Manning

1979 Peak-Load Pricing of Electricity.

In Peter Nemetz (ed.), Energy Policy: The Global Challenge, Institute for Research on Public Policy, Montreal, 349-362.

Abstract:

The paper summarizes a series of analytic studies on the potential effects of peak-load pricing of electricity in the United States. The question of the effects of time-of-day pricing on the amount and timing of energy use is addressed. The analysis is concentrated on large industrial and commercial customers. European data show that some large manufacturing companies are quite responsive to peak-load pricing, reducing their peak-load usage below their off-peak usage. Data obtained from 250 European firms were used to estimate the potential impact in the United States of a time-of-day tariff that would apply for six hours a day, five days a week. European evidence suggests that adjustment to peak-load pricing takes some time, perhaps up to ten years for the full effects to be felt. It is estimated that 44.4 billion kilowatt hours (35% of current peak-load) could be shifted from peak to off-peak hours. The expected reduction in operating costs for utilities ranges between \$0.04 and \$1.8 billion per year (in the short run). In the long run, the savings could increase to between \$1.3 and \$3.5 billion per year. The evidence suggests that plans should be made to apply the concept of peak-load pricing in specific utility systems.

0050

Acton, Jan Paul, Mitchell, Bridger M., and Willard G. Manning

1978 Projected Nationwide Energy and Capacity Savings From Peak-Load
Pricing of Electricity in the Industrial Sector.

(Publication No. R-2179-DOE)

Santa Monica, Ca.: The Rand Corporation.

Abstract: This report examines, quantitatively, the long-run benefit of introducing peak-load pricing into electricity rates (for U.S. manufacturing customers). The value of peak-load or time-of-day pricing depends on the economics of a given electrical utility and consumers' response to the plan. Peak-load pricing has been in effect in some parts of Europe for 20 years, and the projections in this study are based on data gathered in Europe. It is impossible to estimate the statistical demand relationship between price and electricity consumed at different times of the day. If U.S. firms shifted their loads to the same extent as similar firms in Europe, savings could amount to between \$1.3 and \$3.5 billion per year. European experience suggests that firms can make the adjustment to peak-load pricing without a great deal of difficulty.

0055

Acton, Jan Paul, Mitchell, Bridger M., and Ragnhild Mowill

1976 Residential Demand for Electricity in Los Angeles: An Econometric Study of Disaggregated Data.

(Publication No. R-1899-NSF)

Santa Monica, Ca.: The Rand Corporation.

Abstract: The study attempts to improve on the quality of currently available estimates of demand functions in order to provide more accurate predictions of the consequences of changes in energy prices and other factors on household consumption of electricity. Estimates of the determinants of household demand for electricity based on data from Los Angeles from mid-1972 to mid-1974 are presented. The results are highly significant statistically and accord with the predictions of economic theory. The short-run price elasticity of electricity is estimated to be -0.35 , and the long-run elasticity about -0.70 . The income elasticity of demand for electricity is estimated to be about 0.4 . Estimates of price elasticity should be used in forecasting capital requirements or determining revenue requirements for a utility. Any rate restructuring should take estimated price responsiveness into account. Important differences in the price elasticity in different blocks of the rate structure can be expected, with low consumption blocks exhibiting a smaller price elasticity of demand than high consumption blocks.

0060

Adams, Gerald H.

1976 Car Pools (A Bibliography with Abstracts).

National Technical Information Service, Springfield, Va.

Abstract: This annotated bibliography describes the feasibility, methodology and benefits of cooperative automobile use, or "car-pooling," in urban areas.

0065

Agarwal, M., and D. Johnson

1977 Consumers' Attitude Toward Energy Conservation In A Middle-Size City.

Presented at UMR-DNR Conference on Energy, Rolla Missouri, October.

Abstract: This study explores the attitude of household consumers towards conservation in their electrical usage. It examines whether a time-of-day pricing structure will influence their response to shifting their electrical usage from peak to non-peak hours. It also attempts to measure their perceived elasticity of electricity consumption.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Ahern, W.R., et al.

1975 Energy Alternatives for California: Paths to the Future.
 (Publication No. R-1793-CSA/RF)
 Santa Monica, Ca.: The Rand Corporation.

Abstract: The results are provided of a major Rand study to identify and analyze energy policy issues facing California, with emphasis on developing a coordinated state policy response. The study assembles information bearing on these issues, defines key alternatives for the state and discusses the implications of these alternatives for state energy policy. Following an overview of past and future resources and uses of energy in California to the year 2000, the study addresses nine energy supply issues: West-East oil movement, off-shore oil and gas development, a northern California deep-water port, liquified natural gas, gas transportation from the North Slope of Alaska, natural gas regulation, natural gas allocation policies, electricity generation and the development of alternative energy sources. Conservation measures are examined in the transportation, residential, commercial and industrial sectors. Finally, the implications of three different scenarios of California's energy future are discussed, each with a different set of policy actions.

Ahmed, Sadrudin, De Camprieu, Lenaud, and Haider Sayeed

1979 Energy Conservation, Durable Product Purchase, and Rokeach Value Scale.

Paper presented at the Canadian Association of Applied Social Research, Montreal, June.

Objective: To extend the use of the Rokeach scale so that government can better understand the role of the energy conservation ethic in the purchase of consumer durable products

Method: 417 residents of the Ottawa/Hull area were surveyed. An effort was made to include respondents of different incomes, education levels, ages, sex and language.

Variables: Dependent: importance placed on various attributes in making (1) an appliance purchase and (2) a car purchase. Appliance attributes included: a detailed brochure on all aspects of the appliance; features that will reduce cleaning time and give more material comfort; features that are new and unique "to prove I bought a first-rate product"; energy saving features that benefit the whole society; "energy saving features that benefit me personally"; a salesperson that can give a logical reason to buy the product; a "salesperson whom I can trust." Car attributes included: appearance; speed; mileage; lifetime energy cost; lifetime total cost; distinctive features; emotional appeal; durability

Independent: values (36 in all; e.g., a comfortable life, a world of peace, freedom, salvation, cleanliness, honesty, politeness)

Correlation and multiple regression analyses were performed.

Findings/implications: In making an appliance purchase, the attribute "energy features that benefit me personally" was ranked first, followed by "detailed brochure." Least important were new and unique features. In making a car purchase, durability was ranked as most important, followed by car mileage, lifetime total cost and lifetime energy cost. Least important were speed and emotional appeal. For the appliance purchase decision, values best explained the variation in "energy features that benefit the whole society" ($r^2 = .15$) and "features that are new and unique" ($r^2 = .13$). For the car purchase, values provided the lowest level of prediction for the attribute, car mileage, ($r^2 = .02$) and the highest for appearance ($r^2 = .17$) and distinctive features ($r^2 = .15$).

It may be possible to reach the more socially conscious segments of the market by making appeals which are based on certain values.

0080

Albrecht, Stan L.

1976 Socio-Cultural Factors and Energy Resource Development in Rural Areas of the West.

Unpublished manuscript, Department of Sociology, Brigham Young University.

Objective: To examine the impact of energy resource development on nearby communities

Method: A theoretical model was developed of the sociocultural impact of boom growth communities based upon social and demographic data from several such communities in Wyoming and Montana which face extensive population growth due to large-scale energy resource development. Secondary data, mostly from the U.S. Bureau of Census for 1960, 1970, and 1974, are utilized.

Variables: The effect of energy resource development upon population growth and social change in adjacent communities

Findings/implications: Data from the impacted communities suggest that they experience interpersonal, family and community social problems; problems in the delivery of social services; and impacts on the physical environment that have social or quality of life implications.

Anderson, C. Dennis

1977 Consumer Behavior and Energy Information Labels for Home Appliances.

In G.H.G. McDougall and R. Drolet (ed.s), Marketing 77: The Canadian Perspective, Marketing Division Proceedings, Administrative Sciences Association of Canada, 1977, 276-286.

Objective: To determine the nature of consumers' appliance purchase decision in terms of the importance consumers attach to various appliance attributes, and the extent of perceived differences among competing appliances on these attributes

Method: A research study was generated via personal interviews with a convenience sample of recent buyers of new refrigerators and freezers. Subjects were given a structured questionnaire to measure: (1) the three most important reasons for choosing the particular appliance; (2) ratings of a closed-ended list of appliances' attributes; (3) ratings of the differences among appliances of the type chosen among selected attributes; and (4) various cost perceptions for the appliance chosen.

Variables: Attributes of appliances, the importance attached to that attribute, cost associated with various attributes, information labels and consumer attitude and behaviour

Findings/implications: (1) No respondents mentioned energy concerns in response to the open-ended question on reasons for choosing the particular appliance item; (2) energy-related attributes are not determinant attributes for the purchase of refrigerators or freezers; (3) the value of energy labelling is questioned; (4) purchasers appear unwilling to trade off operating cost savings for the convenience of frost-free operation; and (5) knowledge of cost savings alone will not ensure choice of energy-efficient appliances.

Given that consumers may disregard energy information labels as an integral part of their purchase decision-making, the possible options available for policy makers are: (1) intensive education of the public regarding energy information labels; (2) economics incentives towards the purchase of products that are less energy intensive; and (3) indirect legislation affecting the performance/efficiency standards of products.

0090

Anderson, C.D. and Robert Lloyd

1978 The Effects of Alternative Appeals on Consumer Attitudes and Purchase Intentions for Solar Home Heating Products.
University of Manitoba working paper.

Objective: To examine the effects of different appeals on consumer attitudes and purchase intentions regarding solar home heating products

Method: A field experiment, post-test only with a control group. The sample was approximately 300 Winnipeg residents selected at random from the Winnipeg Telephone Book.

There were two test groups and a control group. The first test group received a financial appeal (i.e., a "personal financial savings" information treatment). The second test group received a nationalistic appeal (i.e., a "savings to the nation" information treatment).

Variables: Dependent: the importance of choice criteria in selecting a home heating system, self-reports, objective measures of behaviour

Independent: the messages, various socioeconomic dimensions

Findings/implications: There was no significant treatment effect. Subjects reporting the highest behavioural intention of adopting solar heating systems were generally already engaged in energy-conserving behaviour. The most important reason for re-insulating houses was reported to be monetary savings (77% of subjects); only 11% reported energy saving as the most important reason for re-insulating. Consumers who appeared most receptive to solar products generally had less than a college education, were middle income and over 44 years old.

Consumers appeared confident that technology would advance rapidly enough to make solar heating viable in the near future.

Solar heating systems were perceived as safe and inexpensive; however, they were also perceived as less reliable and more expensive to repair than conventional heating systems.

0095

Anderson, Kent P.

1972 Residential Demand for Electricity: Econometric Estimates for California and the United States.
(Publication No. R-905-NSF)
Santa Monica, Ca.: The Rand Corporation.

Objective: To identify and assess the quantitative impacts of important electricity demand-determining factors in the United States and California

Method: Data used for the analysis consisted of 1947-69 figures for California, and 1969 figures for the United States.

Variables: Dependent: level of consumption (demand)

Independent: average per capita income; average size of household; fraction of population living in non-metro areas; average January and July temperatures; number of all-electric customers per 100 utility customers; electricity and gas costs; time (accounting for the introduction and diffusion of new types of appliances)

Least squares regression techniques were applied to the data.

Findings/implications: The 50-state regression results yield statistically significant evidence that residential demand is influenced by all explanatory variables except the cost of gas and average January temperature. The proportion of all-electric homes has an important influence upon demand, but is not sufficient to account for all of the influence exerted by energy costs and income on demand. The proportion of all-electric households is, however, related to energy costs and the average number of persons per household. For California, the time-related phenomenon is responsible for a substantial portion of the growth in average demand between 1947 and 1969. It may become necessary to impose limitations directly upon demand if the demand grows as estimated by 2000 (to four times as great as 1972, and perhaps eight times as great). Taxes levied on electricity or appliance wattages might be used to curtail demand.

0100

Anderson, Kent P.

1972 Some Implications of Policies to Slow the Growth of Electricity Demand in California.

(Publication No. R-990-NSF/CSA)

Santa Monica, Ca.: The Rand Corporation.

Abstract: The study examines the external costs of "externalities" that might be incurred by resorting to policies whose immediate objective is to slow the growth of electricity consumption. The slowing of electricity growth is one way of mitigating the difficulties presently anticipated regarding the needed expansion of electrical production facilities. Attention is given to the various effects of a taxation policy which might be implemented to slow the growth in demand for electricity. Potentially adverse effects might include: (1) short-run market disequilibrium and temporary financial hardship; (2) loss of manufacturing investment; (3) accelerated growth of natural gas demand; and (4) slowed growth of gross state product and employment. Short-run problems can be avoided through proper design and timing of policies. Early action by California may actually attract industry, if they believe that such action will mean avoiding brownouts and blackouts. Policies designed to reduce demand might exempt certain industries. Firms in non-electricity-intensive industries might be enticed to locate in California if there is slowed growth in the electricity-intensive industries. Coordination of policies with neighbouring states would probably avoid any industry relocation problems. Electricity conservation measures that stimulate increased demand for natural gas are not desirable because the supply of gas is dwindling.

Anderson, Kent P.

1973 Residential Energy Use: An Econometric Analysis.
(Publication No. R-1297-NSF)
Santa Monica, Ca.: The Rand Corporation.

Abstract: The study intends to provide: (1) more insight into the relationship between energy use and energy prices; and (2) a more comprehensive picture of residential energy demand behaviour. Recent studies have not clearly outlined the relationship between energy use and price and the role of inter-fuel substitution compared with the role of alterations in usage or the role of new equipment. Static and demand relationships for residential energy use are estimated using cross-sectional data for 50 states for 1960 and 1970. Explanatory variables include energy prices, appliance prices, household income, household size, urbanity, housing structure and winter and summer temperatures. A number of the directly estimated cross-elasticities are negative, whereas all indirectly estimated ones are positive. The calculated own-price elasticities for gas and electricity are substantially lower in absolute value than their counterparts obtained from the energy consumption equations.

Anderson, K.P.

1974 The Price Elasticity of Residential Energy Use.
 (Publication No. P-5180)
 Santa Monica, Ca.: The Rand Corporation.

Abstract: The long-run elasticity of household energy consumption with respect to price can be expressed as the sum of a usage-level and a fuel-choice elasticity. Using 50-state data for 1960 and 1970, this study describes procedures for estimating mean values for both total elasticity and its two components. The procedures involve the estimation of equations for predicting stocks of energy-using equipment by energy type as well as equations for predicting energy consumption. For "own-prices," the resulting estimates suggest a mean usage-level elasticity of about one-third for electricity and (less certainly) utility gas and a mean fuel-choice elasticity of about 0.8 for electricity and 1.7 for gas. Mean cross-price elasticities vary depending on the energy type and price considered.

0115

Anderson, Richard W., and Mark W. Lipsey
1978 Energy Conservation and Attitudes Toward Technology.
 Public Opinion Quarterly, (Spring), 17-29.

Objective: to explore the relationships between attitudes and values with the acceptance of technical applications; (2) to examine the relationships between general attitudes towards conservation technology with attitudes and behaviour during the energy crisis of 1973/74; and (3) to compare college students with residents of a small urban community

Method: A survey was conducted of a sample of homes (N = 155) and students (N = 100) during the spring of 1974 in Claremont, California.

Variables: Dependent: general attitudes towards scientific and technical progress; approval/disapproval of special technical programs; desirability of owning various technical products; response to energy shortages

 Independent: college/community residents, effect of technology

Findings/implications: The utility effect of technology was perceived as high by 48% of the community respondents, whereas 37% of the students saw it as low and only 35% saw it as high. On the question of whether technology changed the respondents' lifestyles, the data show a high correlation between those who perceive the effect as high and those who rate the changes as for the best. Those who perceived the effects as low also saw the effects on lifestyles as for the worse. The majority perceived the speed of change as just about right. They also believed that technology will solve some of the energy problems confronting them. Students tended to rate the effects of technology as low to ambivalent, but they were generally favourable to owning various technical products. In response to the energy crisis, community respondents generally reduced consumption in terms of conservation as opposed to students. The study indicates that the general population generally had positive attitudes towards technology as well as conservation behaviour. Further research is needed to ascertain why the population expressed these attitudes towards technology. However, since households are the major consuming segment, information and education programs should stress the positive advantages and effects of technology with emphasis on the household sector.

0120

Angell and Associates, Inc.

1975 A Qualitative Study of Consumer Attitudes Toward Energy Conservation.

Chicago: Bee Angell and Associates.

Objective: To examine, in depth, consumer attitudes towards energy conservation and the energy crisis

Method: A marginal frequency analysis was undertaken of public attitudes and conservation behaviour, with respect to the energy situation, involving interviews with a series of ten focus groups of eight to ten per group from four different regions of the United States. Participants were given a cash incentive and were selected from a heterogeneous cross-section of the population. The study is ongoing.

Variables: Attitudes and conservation behaviour

Findings/implications: Respondents were willing to make sacrifices in energy consumption only if the need was severe and the responsibility was shared by all. They generally reacted to energy shortage with frustration and a sense of helplessness, felt the general public was exploiting the situation, and tended to blame the oil companies, public utilities, "business" and the government -- not the Arabs or the OPEC countries. Based on perceived U.S. technological know-how, respondents felt optimistic about the future. Since the energy situation was not regarded as critical, they were generally skeptical of suggestions for large environmental sacrifices.

Appleby, M.R., B. Hodge and G. Miller

1979 Motorists' Attitudes Towards Fuel Economy and Other Automobile Characteristics.

In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Futures, New York: Pergamon Press (Vol. 2, 849-856).

Objective: To determine the attitudes and preferences of motorists in Southern California regarding fuel economy and other automobile characteristics

Method: Three surveys of 5,804 in 1974, 3,538 in 1976 and 3,602 in 1978 were conducted on the Membership Advisory Group of the Auto Club of Southern California.

Variables: Dependent: fuel economy, auto size, auto characteristics

Independent: age, sex, income, education

Findings/implications: On the first area of concern, fuel economy, it was generally found that the minimum acceptable fuel economy increased with each survey. For example, those favouring or accepting 12 or less miles per gallon decreased from 20% in 1974 to 2% in 1978. When the level of 25 or more miles per gallon was examined, the change was from 14% in 1974 to 31% in 1978. Younger respondents wanted higher fuel economy whereas older respondents were less concerned.

Most respondents rated the intermediate-sized car as the best car they have owned, yet in both 1976 and 1978, the majority owned a full-sized car. Females and older respondents favoured larger cars, whereas males and highly educated respondents preferred smaller cars. The majority considered technical performance, style and comfort more important than fuel economy.

The study demonstrates that people are fuel economy conscious, but not sufficiently so to rank it more important than other characteristics. Small cars or even intermediates are perceived more favourably than larger or full-sized cars. The study provides some valuable insight into the composite nature of possible target groups for future policies. What is needed in the future is a careful balance between size, characteristics and fuel economy, but this requires further research on attitudes and preferences.

Arnold, Stephen, and Ronald Turner
1979 Change Strategies for Energy Conservation.
Kingston, Ontario: Queen's University.

Abstract: Since energy conservation is largely dependent on the behaviour of consumers, technical solutions may not be adequate. The attitudes and behaviour of consumers must be changed. The strategies that might be used to induce changes in behaviour and attitudes are described: (1) compliance, where the first change is behavioural based on extrinsic motivation; (2) consistency, where the first change is behavioural based on intrinsic motivation; (3) identification, where the first change is attitudinal based on extrinsic motivation. Applications of the four strategies to transportation energy conservation are discussed. The applications are examined in terms of three types of conservation actions: introducing priority lanes for multi-occupied vehicles; lowering the speed limit; and promoting the purchase of fuel-efficient models. The use of priority lanes could result in fuel use reduction of 1 to 5%. An identification strategy, using prominent personalities to encourage the behavioural change, would probably be most successful. Lowering the speed limit to 50 mph could reduce fuel usage by 3.5% if 50% of drivers complied. The consistency strategy would probably elicit the desired behaviour better than the present compliance strategy. The consistency strategy would involve a multi-stage process and would take several years to implement. As 25 mpg fleet average could result in a 20% fuel saving, so the potential for reducing fuel consumption by increasing the efficiency of new automobiles holds promise. An internalization strategy which would change attitudes towards the inefficient models would probably be most successful. In general, the compliance strategy seems best for changing behaviour in the short term, but its effects are not long lasting. The consistency strategy seems to offer the highest probability of behaviour change, but it is more complex than the other strategies. The strategies can be blended and used in conjunction with each other.

0405

Barnaby, David J. and Richard C. Reizenstein

1975 Perspectives on the Energy Crisis: Gasoline Prices and the South-eastern Consumer.

Survey of Business, September/October, 1975, 28-31.

Objective: To examine consumers' attitudes towards the energy crisis, and their actual behaviour patterns in terms of gasoline consumption

Method: See 0415.

Variables: Attitudes towards various energy-related statements were studied along with reported private vehicle gasoline usage and the price of gasoline.

Findings/implications: (1) Neither set of respondents considers carpooling a desirable means of significantly reducing gasoline consumption. (2) The attitude statements appear to indicate a substantial concern with the energy shortage, a realization of its impact on resource utilization and an improved petroleum company image. (3) As a result of the substantial increase in gasoline prices during 1974, the number of gallons reported utilized by respondents decreased. (4) The authors conclude that gasoline pricing is one potential method of promoting energy conservation.

0410

Barnaby, David J. and Richard C. Reizenstein

1975 Profiling the Energy Consumer: A Discriminant Analysis Approach.
Paper presented at ORSA/TIMS Conference, Chicago, Illinois,
April.

Objectives: To define homogeneous groups in terms of their gasoline usage and home heat preference, and to examine the attitudinal differences between the groups

Method: Multivariate discriminant analysis was carried out of behavioural and attitudinal responsiveness to the energy crisis and consumer segments willing to reduce energy consumption. The analysis was based on a survey conducted February 1974 and repeated October 1974. Data were gathered from a random sample of mail questionnaires (N=2500) of Columbus, Georgia; Charlotte, North Carolina; and Chattanooga, Tennessee.

Variables: The effect of the energy crisis on consumer groups and home heat preference groups, in terms of attitudes and behaviour

Findings/implications: Profiles of high, medium and low gasoline consumer groups and home heat preference groups are given. The major factor which seems to identify the energy-conscious consumer (for both gasoline and heat) is exposure to media and sources of personal information. Income is also an effective discriminator. A negative attitude towards energy conservation and pollution abatement exists among those respondents who desire to maintain the status quo. Major changes between February and October 1974 seem to be increased awareness that energy resources are running short, greater agreement that rationing will become necessary and increased agreement to controlling home temperature by law. Also, fewer respondents agree that oil companies which advertise their efforts to develop new energy sources are more concerned with public relations than with resource development.

0415

Barnaby, David J. and Richard C. Reizenstein

1977 Consumer Attitudes and Gasoline Usage: A Market Segmentation Study.

A paper presented to the Marketing Track, National AIDS Conference, October 1977.

Objective: To compile demographic profiles of groups of (high, medium, low) gasoline users

Method: In February 1974, at the peak of the Arab Oil Embargo, a mail questionnaire was sent to 2,500 residents of three medium-sized (100,000-350,000 population) southeastern U.S. cities; of these, 922 were returned in usable form. Data were analyzed by multiple discriminant analysis. A second mail survey using the respondents of the February 1974 study was conducted in October 1974; 382 of the original 922 returned the second questionnaire.

Variables: A set of 42 attitude, interest and opinion (AIO) variables was included in the survey. The dependent variable is reported gasoline consumption during October 1974, approximately eight months after the cessation of the oil embargo

Findings/implications: Profiles of three gasoline consumption groups were isolated:

(1) Group 1 (less than 10 gallons/week) -- N=65

- mostly male, some female
- mostly married, some separated, divorced or widowed
- average of three people in household
- average income is \$12,000 per year
- own approximately 1.5 automobiles
- agree most that the energy crisis will create personal hardships
- agree least that stringent home energy conservation measures are necessary
- friends and magazines little help as an information source

Barnaby, David J. and Richard C. Reizenstein (cont'd)

(2) Group 2 (10-19) gallons/week) -- N=211

- almost all male
- almost all married
- average of three people in household
- average income is \$15,000 per year
- most own two automobiles
- agree that the energy crisis will create personal hardships slightly more than Group 3 but less than Group 1
- agree that stringent home energy conservation measures are necessary slightly more than Group 1 but less than Group 3
- friends little help as information source, but more than Group 1
- magazines some help as an information source

(3) Group 3 (more than 19 gallons/week) -- N=114

- almost all male
- almost all married
- average of 3.5 people in household
- average income is \$16,000 per year
- most own two automobiles
- agree least that the energy crisis will cause personal hardships
- agree most that stringent home energy conservation measures are necessary
- friends some help as an information source
- magazines more help as an information source than for Group 2

0420

Barnaby, David J. and Richard C. Reizenstein.

1978 Energy/Pollution AIO Segments and Information Source Utilization.
Paper presented at Southern Marketing Association Annual Conference: New Orleans, Louisiana, November.

Objective: To define homogeneous attitudinal segments in terms of their associated demographic characteristics and frequently used energy-related information sources

Method: A questionnaire was mailed to 2,500 residents of three southeastern cities; 922 usable responses were obtained.

Variables: Thirty-one attitude, interest and opinion (AIO) variables included in survey were factor analyzed, yielding eight factors. Howard-Harris Cluster Analysis was used to establish three homogeneous groups. Demographic and information source variables were identified for groups by multiple discriminant analysis.

Findings/implications: Major AIO characteristics of the three groups were as follows. Group 1 felt that energy problems were not of primary importance, that personal sacrifice was not required and wanted to maintain the status quo regarding the energy situation. Group 2 viewed pollution as of secondary importance until energy problems are solved, were adversely affected by air pollution and believed that the energy crisis has a silver lining. Group 3 considered energy problems of primary importance, with personal sacrifice required and were not affected by air pollution. Overall discrimination analysis was statistically significant. Two of the 15 demographic variables significantly contributed to discrimination: income (Group 3 was highest, followed by Groups 1 and 2); education (similarly). Eight of the 15 information sources contributed to discrimination: personal experience (Group 1 less than other groups); children, spouse, friends, relatives, civic clubs, radio and direct mail (Group 2 more than other groups).

Personal information sources and radio and mail offer opportunities for differential impact on energy/pollution attitudes. More research is needed into why visually oriented mass media, which have universal appeal, do not have differential impacts.

Bartell, Ted

1976 The Effects of the Energy Crisis on Attitudes and Lifestyles of Los Angeles Residents.

Paper presented at 69th Annual Meeting of the American Sociological Association, Montreal (August). Also reported in "Political Orientations and Public Response to the Energy Crisis," Social Science Quarterly, Vol. 57, #2 (September), 430-435.

Objective: To examine the energy crisis in its political context -- in particular, the unique context of an incumbent national administration struggling not only for citizen compliance with its policies but also, concomitantly, for its very right to govern

Method: A probability sample (N=1069) was taken of Los Angeles adults between February 12 and May 21, 1974. A multiple regression analysis was used to determine the behavioural and attitudinal effects of the energy crisis and the likely impact on general political orientations and public policies.

Variables: The effects of the energy crisis on beliefs about its severity and duration, feelings about who is to blame, general perceptions of governmental institutions and actors, preferences among alternative energy policies, and expectations concerning future economic conditions and employment

Findings/implications: The only significant predictor of personal energy conservation appeared to be an anticipated effect on one's future employment. Although some changes in basic lifestyle were reported, these were generally perceived as causing minimal personal difficulties. Certain sociodemographic characteristics and energy-related expectations were significantly related to beliefs about who was responsible for the energy crisis. Blacks, women and persons of lower socioeconomic status tended to blame the President; men and non-blacks tended to blame the oil companies. Energy policies having a negative effect on the environment were most often supported by persons more highly integrated into the social order. The findings of this study would predict increasing support for environmentally detrimental activities if the crisis worsens. The data also reveal that a low level of system support or trust would reduce the level of belief in the energy crisis, the level of conservation behaviour, and the tendency to blame the President. A greater level of system support or trust is needed, as this would enhance the government's position in dealing with the energy crisis.

0430

Barth, Michael, et al.

1974 The Impact of Rising Residential Energy Prices on the Low Income Population: An Analysis of the Home-Heating Problem and Policy Alternatives.

Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of the Assistant Secretary for Planning and Evaluation, Office of Income Security Policy, December. Technical Analysis Paper No. 3.

Objectives: (1) to study the effects of rapidly rising residential energy prices, specifically for home heating fuels, on the lower-income population; and (2) to analyze various policy alternatives to ameliorate these impacts

Method: Home heating is discussed with respect to climate, housing characteristics, fuel type and fuel prices. Regional variations in home heating cost increases and the problems faced by low-income households are given special attention.

Variables: The effect of increased energy costs on the low-income population in the United States.

Findings/implications: There are wide variations in heating cost increases as a result of regional differences in energy price levels and in price changes, coupled with variations in climate and type of fuel used. Low-income households spend an average of more than 11% of their income on natural gas and electricity. This compares with less than 2% for households with annual incomes over \$16,000. Yet the poor consume only 56% as much electricity and 82% as much natural gas as the non-poor. The home heating needs of the poor are lower than for other income classes because low-income households are generally located in warmer climates, involve smaller sized homes and are less likely to be single-unit dwellings. But they also have fewer energy-saving features. The net effect is that low-income households pay about three-fourths of what is spent by other households for home heating. However, while actual dollar increases will be somewhat smaller for the poor, the increases must be covered out of considerably smaller incomes.

0435

Battalio, Raymond C., and John H. Kagel

1976 Household Demand Responsiveness to Peak Use Pricing: Implications Drawn from Experimental Studies of Consumer Demand Behavior of Both Humans and Animals.

Paper presented at the Third Annual UMR-MEC Conference on Energy, Rolla, Missouri, October.

Objective: To study the responsiveness of household electricity demand to peak use pricing

Method: An experimental economics approach is taken to the study of consumer demand behaviour -- in particular, peak pricing responsiveness. Both human and laboratory animal experiments are brought to bear on the problem. Data are presented from several sources, including a summer 1975 experimental study of 129 College Station, Texas residential electricity customers.

Variables: Demand responsiveness to peak use pricing

Findings/implications: Experiments involving, respectively, laboratory animals and alcoholic drinkers demonstrate that daily behavioural patterns which are seemingly unresponsive to economic contingencies do adjust when economic variables in the environment are altered. Suggestive parallels to the study of peak use of electricity are discussed. Regarding the latter, the authors believe that where demand is not transferable (e.g., for space heating and cooling), there may be substantially less smoothing of demand in response to time-of-day pricing differentials.

Battalio, Raymond C., et al.

1979 Residential Electricity Demand: An Experimental Study.
Review of Economics and Statistics, 61, 1 (May), 180-189.

Objective: To present information on: (1) the design of and problems encountered in conducting a field experiment in household energy use; and (2) findings concerning responses of households to changes in the price of electricity and information concerning electricity use

Method: The experiment involved two phases and was conducted in College Station, Texas, with more than 100 households participating. In Phase 1, there were five treatment conditions: (1) the high price rebate group, which was eligible for rebates of 1¢ per 1% reduction in KWHR/week, with a maximum of \$15/week and, as well, was provided with feedback on usage; (2) the low price rebate group, which received feedback, along with a rebate of 1.3¢/KWHR reduction/week; (3) feedback; (4) information; and (5) control. In Phase 2, the information-only group was placed on a modified high rebate plan, and the control group was given information. Feedback and rebates were discontinued for the two rebate groups for the last two weeks of the six weeks of Phase 2.

Variables: Dependent: actual electricity consumption

Independent: demographics, treatment

Findings/implications: In Phase 1, mean changes in usage were: high rebate, -3.5%; low rebate, -4.6%; feedback, +1.7%; information, +7.3%; and control, -.9%. Rebate groups and control differ significantly (at .05) from the information group. In Phase 2, the mean changes were high rebate, -8.3%; low rebate, +1.4%; information (now modified high), -7.6%; and control (now information) +.95%. Withdrawal of rebates and feedback from the rebate groups led to an increase in usage relative to that during Phase 1, indicating a somewhat lingering effect from the initial treatments. In evaluating the responses of the information-only groups, it is hypothesized that the information may have resulted in a downward revision of the estimated costs for some activities, thereby promoting their use. It is advised that direct extrapolation of these results to the national average is not warranted.

0445

Baughman, Martin, and Paul Joskow

1975 The Effects of Fuel Prices on Residential Appliance Choice in the United States.
Land Economics, 5, 1, 41-49.

Objective: To estimate the effects of fuel prices on the fuel choice decisions by residential consumers for four important energy usage categories for which consumers face two or more fuel alternatives: space heating, water heating, cooking and clothes drying

Method: An econometric model is used, with the data taken from a cross-section of 48 states for 1969.

Variables: Dependent: proportion of appliance utilization in each category accounted for by gas, oil and electricity

Independent: price of gas, electricity and oil; household income per capita; mean January temperature

Findings/implications: All price variables are significant at the 5% level. For space heating, higher winter temperatures cause electricity to be favoured over gas and oil. Higher incomes generally lead to a preference for gas over electricity and, in space heating and water heating, higher incomes also lead to favouring electricity over oil. It would appear that fuel prices play an important role in appliance choices. There are substantial possibilities for fuel switching in the residential and commercial sectors which should not be ignored in making energy policy.

Initially, the majority of respondents did not make any type of behavioural change during the crisis, while those who did tended to carry these changes fully or partially into the post-crisis period. The demographic breakdowns provide policy makers with target groups for their future policies. However, further research is needed to explore the rationale behind the changes as well as a further examination of other alternatives.

Bearden, William O., et al.

1977 Consumer Preference: Gasoline Rationing or Higher Prices?
Atlanta Economic Review, 27, 6 (November-December), 43-47.

Abstract: Several studies of consumer attitudes towards the current energy crisis are surveyed. A study was initiated to segment consumers by preference for gasoline rationing vs. preference for higher prices, based on data collected at a time when attitudes should have stabilized. These attitudinal segments were characterized along demographic, general psychographic and media-usage dimensions. Sampling and surveying procedures are described. When compared with respondents having preferences for higher gasoline prices, respondents who favoured gas rationing were more likely to be younger, have lower family incomes, be less educated, have smaller families and have a working spouse. The community studied contained a sizeable segment of consumers who favoured limiting gasoline consumption through regulatory actions, such as rationing, rather than through economic control measures, such as price increases. Other results are addressed and implications for public policy planners are summarized.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Becker, B.W., Daniel Brown and Philip B. Schary
1976 Behavior of Car Owners During the Gasoline Shortage.
Traffic Quarterly, Vol. 3, July, 469-483.

Objective: To study how the energy crisis affected the transportation market in terms of what kind of people were willing to respond, how they responded and the underlying reasons for their responses

Method: A survey was conducted of 493 Portland residents during the summer of 1974. The sample was part of a 2,400 sample-based survey done by the Oregon Department of Transportation.

Variables: Dependent: effect on use, types of changes, post-crisis changes

Independent: family size, age, income, education, occupation, sex, urban/rural, city size

Findings/implications: The initial response to the energy crisis was that 52% made changes in behaviour, 26% switched modes of transportation and 18% reduced travel. Of those who made changes, 26% continued their changed behaviour during the post-crisis period, while 51% made a partial return to their pre-crisis behaviour. In terms of demographics, the lower the age, the larger the family size, the higher the occupational status, the smaller the number of cars, the lower the income and for urban residents, the higher or greater the tendency for behavioural change.

Initially, a substantial minority of respondents did not make any type of behavioural change during the crisis, while those who did tended to carry these changes fully or partially into the post-crisis period. The demographic breakdowns provide policy makers with target groups. However, further research is needed to explore the rationale behind the changes as well as a further examination of other alternatives.

Becker, Lawrence J.

1978 Joint Effect of Feedback and Goal Setting on Performance: A Field Study of Residential Energy Conservation.
 Journal of Applied Psychology, Vol. 63, 4, 428-433.

Objective: To examine in a field setting the motivational effects of feedback and goal setting on the performance of a task that involved residential energy conservation

Method: One hundred families living in identical dwellings in central New Jersey were assigned to one of five experimental groups: (1) difficult goal (reduce electricity consumption by 20%), feedback; (2) difficult goal, no feedback; (3) easy goal (2% reduction), feedback; (4) easy goal, no feedback; and (5) control --no goal, no feedback. The experiment took place from August 9 to 31, 1976. Meters were read and feedback given three times weekly.

Variables: Dependent: actual electricity consumption

 Independent: treatment

Findings/implications: The 20% feedback group consumed the least electricity and, in fact, was the only group to consume significantly less than the control group. This implies that families who want to conserve energy should be encouraged to adopt a specific difficult goal and should obtain feedback about their performance. It is not clear that the 20% goal represents the optimal level of difficulty. Conservation efforts may have been due to participation in the experiment. It is not known how long the effects of the goal-setting and feedback would carry on, or if they would linger once feedback was stopped.

Becker, Lawrence J., Seligman, Clive, and John M. Darley
1979 Psychological Strategies to Reduce Energy Consumption: Project
Summary Report.
Princeton, N.J.: Center for Energy and Environmental Studies,
Princeton University.

Abstract: The report is intended to: (1) discuss research on the attitudinal determinants of residential energy consumption; (2) present research into the conservation effect of providing homeowners with feedback about their energy consumption; and (3) discuss miscellaneous "one-shot" studies and surveys bearing on a variety of matters. People have an important role in any comprehensive energy conservation plan, as the energy consumption of a house cannot be completely understood without reference to the people in the house. There is little evidence that relates homeowners' attitudes to actual energy consumption. Three attitudinal surveys conducted by the authors revealed that the best predictor of actual energy consumption is the residents' attitudes about thermal comfort. The implication for residential energy conservation programs and appeals is that people should be told of the ways they can save energy and be comfortable at the same time. To influence actual behaviour, energy conservation must be made more important in a way that involves the whole family, maintains interest in conservation over time and makes salient energy use. Feedback meets these three criteria.

The authors review eight experiments which involved 620 households and the effects of feedback on energy use. These experiments underlined three conditions crucial for the success of feedback. (1) There must be an initial commitment to energy conservation on the part of the residents, as only motivated people will make use of feedback. (2) Feedback must be given in a form that enables residents to evaluate how well or poorly they are doing with respect to their desired level of conservation. (3) The feedback must be credible. The miscellaneous studies revealed that an automatic multi-setback thermostat may increase energy conservation behaviour. Moreover, "average payment" plans, in vogue with some utility companies, have no effect on electrical consumption.

A residential energy knowledge survey led the authors to the following conclusions. Most people do not have a good idea of how much energy they use in their homes or how much they pay for energy. They have inadequate knowledge about the impact of various energy-using devices on total energy consumption, and this lack of knowledge can deflect people from the more effective conservation actions. Finally, many people seriously overestimate the costs and underestimate the benefits of improving the energy efficiency of their homes.

Beeson, John D., David, Frank W., and Frederick J. Wegmann

1977 The Knoxville Transportation Brokerage Project. Volume II:
Operations and Management.

Knoxville, Tennessee: The University of Tennessee, Transportation Center.

Abstract: This report describes the operational development of the commuter transportation brokerage system that was in operation in Knoxville, Tennessee from October 23, 1975 through June 30, 1977. When the Knoxville Commuter Pool (KCP) was established, the concept of a transportation broker came into effect. If it proved workable, it was to become an arm of the proposed City Department of Transportation. Commuter services were the primary object, since commuters composed the group which was most easily identifiable and where the greatest possible benefit would be felt. The initial purpose of this research was to develop and put into operation a multimodal public and private transportation service throughout the Knoxville metropolitan area. This plan would allow each form of transportation to provide the service that it could most effectively furnish, and would offer transportation options to most parts of the community that could not be served at that time. The instrument through which the project objectives would be obtained was the transportation broker, who could coordinate all modes of transportation. The broker would not promote one mode of transportation over another, but would promote all modes in order that the broad objectives of the community would be met. Each individual commuter or group requesting service would be provided with a series of transportation alternatives that permitted the highest level of service at the lowest possible cost. These alternatives included vanpooling, which this study addresses extensively. Although this report covers a two-year period, only approximately 18 months were used for operational purposes. KCP is now working under the City Department of Transportation, and its future plans include a contained effort to find better ways to promote all forms of ridesharing within the metropolitan area. There was no time to realize the full potential of the brokerage concept by June 30, 1977. However, sufficient accomplishments were achieved to show that the concept has the potential to solve many of the transportation problems with which cities are now faced.

0475

Bell, P.C., and R.M. Knight

1978 The Effect of Individual as Opposed to Master Metering of Electrical Service for Apartment Buildings in London, Ontario.
London, Ontario: The University of Western Ontario.

Objective: To identify and evaluate the potential costs and benefits of converting existing and/or new apartment buildings to individually metered units

Method: Thirty-seven apartment buildings were sampled in London, Ontario (33 yielded usable data--1,121 units). Occupants provided data on apartments and themselves; landlords provided data on their buildings; contractors provided data on the cost of conversion; and the London Public Utilities Commission (PUC) provided data on the cost of individual billing.

Variables: Dependent: power consumption

Independent: type of apartment (townhouse, low rise, high rise, electrically heated, average rent/suite, average number of bedrooms, number of elevators, year of construction, number of floors, percentage of window air conditioners, percentage of external outlets, number of rental suites, percentage of electrically heated garage spaces); sociodemographic/behavioural (not specified)

Findings/implications: Note: landlord and tenant data is not analyzed or explained in this report.

Bulk metered townhouses consume, on average, 5,627 kwh per annum more than individually metered counterparts; suites in low rise buildings, 2,090 kwh per annum more; electrically heated suites, 5,034 kwh per annum more (tentative estimate); but there is no significant effect for suites in highrises.

The significant variables (found by multiple regression) affecting power consumption are: for all 33 buildings (electric sauna, electric heating, townhouse, meter type); for all buildings except one luxury low rise that had particularly high power consumption (townhouse, electric heating, meter type); for 31 buildings without electric heating (average rent, townhouse, electric sauna, meter type).

Individual metering of all existing townhouses and lowrise apartments in London would save 17.4 million kwh per annum, which is less than 1% of London PUC billings to end users. Projections for Canada estimate that individual metering would save .44% of total billings to end users.

Bell, P.C., and R.M. Knight (cont'd)

The estimated cost of conversion for low rise buildings was \$350 per suite and, for highrises, \$350-\$500, depending on the type of panels used in construction. Some buildings are impossible to retrofit. The cost of meter reading and billing was estimated at \$12.88 per Ontario customer (1975 figures).

Berkowitz, M.K., and G.H. Haines, Jr.

1979 A Multi-Attribute Analysis of Consumers' Attitudes Toward Solar Heating.

Toronto, Ontario: University of Toronto, Institute for Policy Analysis.

Objective: To study the relation between overall preferences and heating system attributes or characteristics to discover how to translate these overall preferences into consumer action

Method: Data was collected from 2,019 households across Canada. Preferences towards four heating modes (gas, electric, oil and solar) were determined through the use of pairwise mode comparisons and by asking respondents to state their preferences. Respondents were asked to evaluate the importance of 16 attributes in their purchase decisions.

Variables: Preference for specific heating mode (gas, electric, oil or solar). Four of the 16 attributes were most frequently mentioned and were used for the attitude measures were: reliability; absence of fumes or odors; safety; future availability of fuel supply.

Four tests were performed. First, an examination was performed of the proportion of respondents within the sample whose attitude score ranked a heating mode highest and for whom that mode was also identified as most preferred. Two comparisons were done, the second including cost variables. Second, a regression was carried out of the individual's most preferred heating mode vs. the attitude score for that mode. Pairwise mode preference comparisons were made by respondents and attitude scores were then regressed for each mode against the corresponding preference value for that mode. Finally, an examination was conducted of the confusion matrix of heating mode rankings by attitude scores vs. the rankings derived from the ordinarily measured overall preference values.

Findings/implications: The results generally supported the contention that consumer preferences for heating modes can be disaggregated into their preferences for the characteristics which comprise each heating mode. For example, in Test 1, 50% of respondents ranked a heating mode highest in both stating preferences and on attitude score. Costs are not as important a variable in forming a preference for solar heating as they are for the conventional modes. For those preferring solar heating, the four attributes mentioned above are more important in forming their preference. If a transition to solar heating is to be realized, these characteristics must be incorporated into the solar technology as well as being demonstrated to exist to consumers.

0485

Berman, M.B., M.J. Hammer, and D.P. Tihansky
1972 The Impact of Electricity Price Increases on Income Groups:
Western United States and California.
(Publication No. R-1050 NSF/CSA)
Santa Monica, Ca.: The Rand Corporation.

Objectives: To determine: (1) whether new prices for electricity affect different income groups equally; (2) the changes in residential consumption; (3) consumers' burdens as a result of governmental actions; (4) what can be done to eliminate unequal impacts; and (5) information on the patterns of consumption

Method: Econometric analysis based on: (1) Western U.S. data from the Bureau of Labour Standards and the Federal Power Commission for 1960-61 with a sample of 1,770; and (2) California data from Los Angeles utilities for 1970 with a sample of 1,000.

Variables: Dependent: income in conjunction with stock of appliances, size of household, size and volume of housing unit, variance of outside temperature, time spent away from home

Independent: prices

Findings/implications: Consumers with incomes over \$5,000 (60% of the sample) consumed 80% of the electricity demanded in the residential sector, whereas those with incomes below \$3,000 (17% of the sample) consumed only 6%. Low-income groups had more difficulty reducing consumption in 1970 than in 1960/61. Furthermore, high-income earners consume the most electricity, pay the lowest percentage of income for electricity and have the highest saturation of consuming appliances. The data indicates that the ability to reduce consumption increases with income, which is related to their high levels of consumption, costs and product saturation.

Berman, M.B., and M.J. Hammer

1973 The Impact of Electricity Price Increases on Income Groups: A Case Study of Los Angeles.

(Publication No. R-1102-NSF/CSA)

Santa Monica, Ca.: The Rand Corporation.

Objective: To estimate the differential effects of electricity price increases on the various income groups in the residential sector of the Los Angeles area

Method: A sample survey of 1,736 meter reading units was carried out across 55 census tracts of the Los Angeles area. The data were collected through bi-monthly meter readings between December 1970 and November 1971. The census tracts were selected from the 1960-70 U.S. Bureau of Census information and land use surveys done by the Los Angeles Department of Water and Power.

Variables: Dependent: energy consumption, energy costs, appliance end use

Independent: income, number of rooms, number of people

Findings/implications: The study found that lower-income groups spend a greater percentage of their income on energy-related expenses, especially electricity. Furthermore, high-income groups have a greater ability to conserve/reduce consumption when faced with higher costs. Also, higher-income groups tend to have a larger stock of appliances in their homes. They are able to shift from electricity to natural gas when prices become too high. Finally, economic incentives for conservation tend to favour the higher-income groups. This is seen in the capability of higher-income groups to pay high initial costs to receive long-term savings.

The overall implications of this study are that low-income groups are significantly affected by electricity price increases. Price increases tend to be regressive towards the lower-income groups, which spend a higher percentage of their income on energy while consuming a smaller percentage of energy (electricity). Their ability to affect energy consumption is adversely affected by their income level, whereas the higher-income groups are generally favoured.

Blakely, Edward J.

1976 Energy, Public Opinion, and Public Policy -- A Survey of Urban, Suburban, and Rural Communities.

California Agriculture, 30, 8 (August), 4-5.

Objective: To examine the relationship between place of residence and: (1) attitudes about the causes and potential consequences of the energy crisis; (2) energy-related community behaviour and lifestyle; and (3) preferred alternatives in terms of public policy on energy

Method: Questionnaires were mailed to samples of metropolitan Sacramento (N=800), the nearby small city of Winters (N=600), and rural Capay Valley (N=200). The return rate pursuant to reminders was 62.5%. Results were weighted for the marginal frequency analysis.

Variables: The effect of place of residence on attitudes, behaviour and preferences concerning the energy crisis and public policy towards it

Findings/implications: Respondents across residence and location classes held similar opinions on the energy crisis and its overall consequences for themselves and the nation. The real dichotomy between urban and rural respondents was with regard to the role of government in solving the problems. Rural and suburban respondents were more opposed to direct government intervention and controls than urban residents. Rationing was disapproved of by all segments of the samples, with rural and suburbanite respondents the most antagonistic.

0500

Blakely, Edward J., and Howard G. Schutz

1976. Energy, Community, and Quality of Life in California: A Survey of Urban, Suburban, and Rural Communities.

The Journal of Energy and Development, 2, 1, 224-238.

Objective: To ascertain whether place of residence (urban, suburban, rural): (1) affected a person's attitudes toward the causes and potential consequences of the energy crisis; (2) had differential effects on the availability of goods and services for individuals and households; and (3) influenced respondents' current or future actions

Method: Questionnaires were sent to 1,600 residents of the Sacramento Valley in California. The response rate was 63%. Tests revealed no significant non-response bias.

Variables: Dependent: opinions on the cause of the energy crisis, the potential duration of the crisis, public officials' capacity to respond to the crisis, preferred alternatives to solve the crisis, community behaviour and lifestyles, public morale and confidence

Independent: place of residence, demographics

Findings/implications: There were no significant differences among the opinions held by the three different groups regarding the causes of the energy crisis, the duration, the reaction of public officials to the crisis or the preferred production alternatives. About half the respondents felt that the crisis was contrived by the oil companies. About two-thirds believed that the crisis would endure for many more years. Public officials and institutions were generally rated poorly for their response to the crisis (the government and the oil companies were rated as good and excellent by about 10% of the respondents, public utilities by about 28%). Respondents endorsed building the Alaska pipeline, improving public transportation and investing whatever money it takes to develop new energy sources; they were generally against building nuclear plants. It was felt that the energy crisis was having a negative impact on the morale or spirit of the nation. Suburban and rural people were less negative (40%) about the crisis than were urban residents (46%). The rural lifestyle was revealed to be more frugal, meaning that rural residents have fewer plausible sacrifices to make regarding energy use. Rural and suburban residents were much more reluctant to use government intervention as a device to insure adequate fuel supplies. There is a need for public confidence in the government and institutions before any policies can be implemented regarding the energy crisis. Policies should be formulated so as to allow their differential application according to the local situation. Energy policies can in themselves dictate the pattern of settlement, and this should be considered when policies are being developed.

Blakely, Elbert

1978 The Effect of Feedback on Residential Electrical Peaking and Hourly Kilowatt Consumption.

Thesis presented to The School of Graduate Studies, Drake University.

Objective: To study the effects of 15-minute feedback on overall consumption and on peaking during the summer months when air conditioners were in use

Method: Three families (two in an apartment complex, one in a single family dwelling) participated in the experiment. Each family had a stove, refrigerator, television, radio, dishwasher and an air conditioning unit. Each dwelling was equipped with a feedback device and a recording device. The feedback device consisted basically of a light bulb and a buzzer, and the recording device monitored electric consumption during every 15-minute period of the day (96 of them). When the family consumed more than some predetermined amount in a 15-minute period, the buzzer sounded and the light went on.

Variables: KWH consumption per 15-minute period and per day; number of peaks (number of times the predetermined level was reached); duration of peaks (cumulative minutes in each 15-minute period consumption was above level)

Findings/implications: Using data gathered only on "humid" days, all three families decreased consumption from baseline to feedback condition. Two families showed a reversal to baseline once the feedback was removed, while reversed data could not be gathered from the third. Feedback decreased consumption in both peak and non-peak periods during the day. Research is needed to compare the relative effects of weekly, daily and 15-minute feedback procedures. Differential rate structures based on time-of-day use may be more effective in reducing consumption during peak periods than informational approaches.

0510

Blevins, Audie L., Jr.

1976 Public Response to Municipally Owned Utilities in Wyoming.
 Land Economics 52, 2 (May), 241-245.

Objective: To examine consumers' attitudes toward municipally-owned utilities

Method: This report is based on a 1972 survey of 215 randomly selected households in five communities with municipally-owned electrical distribution systems and of two communities with privately owned electrical systems.

Variables: Attitudinal perceptions of municipally-owned power systems

Findings/implications: Residents in the communities with municipally-owned utilities favour public power, are satisfied with the cost of electricity, and believe that public power is an equitable way to raise revenue. Respondents in communities with private power generally favor municipally-owned power and are equally divided over the issue of their community entering the power business.

0515

Blevins, Audie L., Jr., et al.

1974 Assessing the Social Impact of Energy Related Growth in Wyoming.
Paper presented at the Annual Meeting of the Society for the
Study of Social Problems, Montreal, August.

Objective: To examine consumers' attitudes towards coal development

Method: A January 1973 random sample survey of 219 persons was
taken, representing a cross-section of individuals in Campbell County, Wyoming.

Variables: Attitudinal perceptions of social impacts of coal development

Findings/implications: A large percentage of the respondents are fearful
of the damage strip-mining will do to the physical environment and their lifestyles. They would like to see strict reclamation controls instituted.

0520

Bloom, Martin, et al.

1975 The Effect of Rising Energy Prices on the Low and Moderate Income Elderly.

Washington, D.C.: Federal Energy Administration, March.

Objective: To study the effects of energy cost changes on the income and expenditures of the low and moderate income elderly

Method: Expenditure data are from the 1973 Washington Center for Metropolitan Studies Nationwide Sample (N=1455) and its sub-sample (N=115) of poor households where the age of the head is 65 or over. Secondary data on household consumption patterns and prices are taken from the U.S. Bureau of Labor Statistics documents. The climatic data are from an atlas put out by the U.S. Department of Commerce.

Variables: The effects of increasing energy costs on the elderly in the United States, particularly as related to age, income, climate and type of fuel at the national, regional and SMSA levels

Findings/implications: Nationally, the elderly poor consume less energy than any other age-income group. Energy expenditures increase gradually as income levels rise for all ages combined, but for the age group 65 and over the increase is dramatic from the lower-middle-income level to the upper-middle-income level. There were smaller differences in expenditures across income levels for natural gas relative to electricity and gasoline. For all U.S. regions, lower-income elderly couples spent a disproportionate amount of their budget on fuel and utilities, compared to similar intermediate or higher budget households. The reverse was found regarding expenditures on transportation. Elderly households spent a much higher portion of their budget for energy in colder than in warmer regions. Energy price inflation hit hardest in the New England and middle Atlantic States, and least in the south and southeast. Overall, the rapid rise in energy prices was found to have imposed a severe economic strain on the elderly.

Blumstein, Carl, et al.

1979 Residential Electricity Demand in California: Results and Methodology.

In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Futures, New York: Pergamon Press (Vol. 1, A30-A40).

Objective: To present forecast results using a model of electricity end-use developed by the California Energy Commission

Method: An econometric model is used to forecast electricity demand. Data were collected by various California utilities in 1977, surveying more than 50,000 households. Demand is disaggregated by 12 end uses, three housing types and 11 climate zones. Six alternative scenarios (from baseline) were evaluated.

Variables: End uses: refrigeration, freezing, cooking, hot water heating, dishwashing, clothes washing, clothes drying, television, lighting, space heating, air conditioning, pumping for swimming pools; housing types: single family, multiple family, mobile home; population; number of persons per household; appliance saturation; new construction; fuel choice availability; energy consumption per end use

Scenarios: growth rates in households (high/low); energy prices (high/low); conservation efforts (high/low)

Findings/implications: High/low price and high/low population scenarios do not diverge materially from baseline projections. Baseline growth statewide is 2% per year. Growth projections for the various alternatives are: high price, 1.85% per year; low price, 2.13%; high population, 2.17%; low population, 1.61%; low conservation, 3.17%; high conservation, 1.23%. The model should perhaps incorporate behavioural differences in appliance choice and usage along the income and family size dimensions. More precise data on sales of electricity by customer type could also be used.

0530

Bottinelli, Charles

1979 The Status of U.S. Energy Education Policies.
In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use
Futures, New York: Pergamon Press (Vol. 2, 667-674).

Objective: To determine the status of state policies and practices regarding energy education at various state levels

Method: A survey was conducted of 50 state educational agencies, state offices of energy, governors' offices, and state legislatures between May 1978 and July 1978.

Variables: Dependent: staff involvement, recommendations on energy education, in-service assistance, awareness of others

Independent: four levels of state involvement

Findings/implications: Of all levels of state government, the state educational agencies are the most actively involved with energy education. These agencies generally have a staff member in charge of energy education (75%), whereas the other three levels reported no specific staff member involved with energy education. Furthermore, the state educational agencies generally provide a high percentage of educational recommendations, as well as a moderate amount of in-service assistance (41%). However, state energy offices have moderately incorporated energy education into their programs (41%). In the case of awareness, over 50% of the state educational agencies were aware of the activities by the other levels. The state legislatures were moderately aware, especially towards the educational agencies and energy offices.

The major finding of this study is that there exists a high degree of poor communication between the four levels, as demonstrated by the low levels of awareness. However, both the state educational agencies and state energy offices are assuming a greater role and a higher percentage of federal funds in energy education. What is needed is a more intense and integrated program with one agency or office in charge, primarily the state educational agency.

Bowman, Carole H., and Martin Fishbein

1978 Understanding Public Reaction to Energy Proposals: An Application of the Fishbein Model.

Journal of Applied Social Psychology, 8, 4, 319-340.

Objective: To demonstrate relationships for voter decision-making in the energy area concerning actual voting behaviour, behavioural intentions, attitudes toward the behaviour, and subjective norms.

Method: The first stage involved interviewing potential voters on nuclear power related referenda, 17 in Colorado and 19 in Oregon. Five hundred questionnaires were subsequently mailed to subjects in Portland, Oregon, during October 1976. Eighty-nine usable responses were obtained. Followup calls were made to these 89 and to 40 others to determine actual voting behaviour (voting took place November 2, 1976).

Variables: Dependent: actual voting behaviour

Independent: demographics; behavioural (voting) intention; attitude toward the act of voting "yes"; evaluations of consequences; belief about act; subjective norm; normative belief; motivation to comply; attitudes towards construction of more nuclear power plants, a halt in the operation of nuclear power plants and the use of nuclear energy

Findings/implications: Voting intention strongly predicted actual voting behaviour ($r=.89$) and intention, in turn, was predicted by attitude towards the act and subjective norm ($r=.92$). Demographic variables failed to correlate significantly with either intentions or behaviour. The predictive power of the Fishbein model is clearly demonstrated. The overall trend was for "yes" and "no" voters to agree upon the goodness or badness of the outcome, but to disagree consistently on the perceived benefits of the ballot proposal. Two beliefs distinguishing the two concerned the dangers of nuclear waste and the economic effects of plant construction. Both groups perceived those close to them to hold similar beliefs to their own. Scientists were held in the highest esteem in terms of inspired confidence. The Fishbein model may be useful in understanding and predicting public reaction to future energy proposals.

Brunner, James A., and Gary F. Bennett

1977 Coping with the Energy Shortage: Perceptions and Attitudes of
 Metropolitan Consumers.

 Journal of Environmental Systems, 6, 3, 253-268.

Objectives: (1) to ascertain how consumers in Toledo, Ohio perceive the energy crisis, its seriousness, consequences and effect upon their lifestyles; and (2) to determine what measures consumers feel would be most appropriate for dealing with the situation.

Method: The survey was conducted in 1974 and 1975. Questionnaires were mailed to 600 and 940 consumers, with returns from 360 and 564.

Variables: Dependent: perceptions of the existence/duration/causes of the energy problem, degree of concern about the problem, attitudes toward measures the government could take and current government actions

 Independent: demographics

Findings/implications: In 1975, 65% of respondents agreed that an energy problem existed (vs. 62% in 1974). More educated, middle-aged and higher-income families were more concerned about the problem than the general population. Over half the respondents felt that the energy problem was one of long-term duration. The oil companies were singled out as one of the main causes of the problem by 55% in 1975 and 63% in 1974. "Unconcerned" persons were more apt to blame the oil companies than were "concerned" persons (71% vs. 47%). More people (37%) blamed federal regulations for the problem in 1975 than in 1974 (18%). Concerned respondents were generally less opposed to gasoline rationing and higher gasoline prices than those who were unconcerned (39% and 21% vs. 25% and 8%). There was a decline in the efforts made by respondents to conserve gasoline from 1974 to 1975. In 1975, concerned respondents took more energy-conserving actions than those who were unconcerned. Most people (65% in 1975) felt that the federal government was not doing a good job in terms of making an effort to solve the problem. Many (74%) indicated that a rise in gasoline prices of 10¢/gallon would prompt them to consider gasoline economy in the purchase of a new car.

0545

Brunner, James A., and Gary F. Bennett

1978 The People Speak on Resolving the Energy Problem and the Proposed
Solutions: Perceptions of Metropolitan Consumers.
Energy Communications, 4, 3, 239-256.

Abstract: Perceptions of metropolitan consumers concerning the seriousness of the energy problem and its roots are detected and delineated. Opinions about proposed solutions offered by President Jimmy Carter are measured. Interviews were conducted in the spring of 1977 in the Toledo, Ohio area. Only one-third of those surveyed agreed with the President's assessment of the gravity of the energy problem, and 60% favoured construction of nuclear power plants. Only dramatic increases in gasoline prices will affect consumption. Energy vs. environmental concerns are also polled.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

0550

Bullard, Clark W., III, and Robert A. Herendeen

1975 Energy Impact of Consumption Decisions.

Institute of Electrical and Electronic Engineers Proceedings, 63,
3 (March), 484-493.

Objective: To determine the energy cost of goods and services, based largely upon a 360 factor input/output analysis of the U.S. economic system

Method: The model is applied to illustrative problems, including (1) the total energy cost of an automobile and an electric mixer, (2) the energy impact of urban bus and auto transportation, (3) the total energy impact of a family's expenditures, (4) the impact on energy and labour of government spending, (5) industrial energy dependence, (6) national import-export energy balance and (7) an energy conservation tax. Secondary data are used and are taken from various statistical sources for the year 1963.

Variables: The direct and indirect effects of consumption decisions in selected sectors of the economy on energy consumption

Findings/implications: A set of tables is provided which summarizes the results of the analysis of the seven problems listed above. Regarding the energy impact of a family's expenditures for the lowest-income group, energy purchases account for two-thirds of the total purchases while, for the highest-income group, the fraction drops to one-third. Estimates of the impact of direct energy use only might therefore be misleading.

0555

Bultena, Gordon L.

1976 Public Response to the Energy Crisis: A Study of Citizens' Attitudes and Adaptive Behaviors.

Ames: Iowa State University.

Objective: To examine the energy-related attitudes and behaviour of three socioeconomic groups

Method: A random sample interview survey was undertaken of 190 persons from different socioeconomic groups in Des Moines, Iowa. Questions focused on attitudinal and behavioural responses to the 1974 energy crisis. Differences between the three social-class groups were tested for statistical significance using Chi Square.

Variables: Attitudes/perceptions of the crisis, impact of shortages on behavioural patterns, socioeconomic effects, and sociopolitical actions of respondents, all referenced to upper (N=56), middle (N=74) and lower (N=60) class groups

Findings/implications: Most respondents attributed shortages to the actions of large oil companies, not to dwindling energy reserves. Middle- and lower-class respondents more often blamed activities of large oil companies and concomitant government favouritism. Upper-class respondents tended to perceive the energy shortage in terms of dwindling energy reserves. More upper-class persons reported taking energy conservation measures than middle- or lower-class persons. Upper-class respondents also emphasized environmental quality goals, whereas lower-class respondents reported a major interest in keeping energy prices down.

0560

Burdge, Rabel J., Paul D. Warner, and Susan D. Hoffman
1976 Public opinion on energy.
 Unpublished paper, University of Kentucky.

Objective: To investigate consumers' attitudes towards the energy situation and possible government interventions

Method: Marginal frequency analysis of opinions on various energy conservation and utilization measures based on a statewide survey taken in Kentucky (N=3,438).

Variables: Energy use for transportation, home consumption, new energy sources, government regulation of energy use

Findings/implications: Respondents were willing to accept energy conservation measures in personal transportation and home use and to support the development of new energy sources with government funding.

Burnette, Paula and Don C. Carner

1979 California's Residential Energy Commission Profiles.

In R.A. Fazzolare and C.B. Smith (ed.s) Changing Energy Use Futures, New York: Pergamon Press, Vol. 2, 845-873.

Objective: To study the relationship between attitudes and social structure of the subjects, the capacity of the subjects' homes and appliances to consumer energy, the interaction of the home with climatic variables and the actual consumption pattern.

Method: A survey was conducted of a random stratified sample of 499 California households during the summer of 1978 by the California Energy Commission. The study was done in three stages: (1) interviews to obtain information on knowledge, attitudes, preferences and behaviour; (2) a physical profile of the home; and (3) actual consumption patterns.

Variables: Dependent: consumption (electricity and natural gas)

Independent: attitudes towards the problem, conservation and the future; home characteristics, behaviour or product use; demographic information (age, income, family size and education)

Findings/implications: Families which were fairly well off in terms of demographic backgrounds consumed the highest percentage of energy, while those of lower demographic characteristics consumed the lowest percentage of energy. The electricity consumption of the affluent families was affected by such factors as the number of freezers, attitudes towards conservation, electric heat type, space cooling type and attitudes towards the future. In the case of natural gas, the main influential factors were winter day exposure, walls of home, income, family size, heating degree days and having a pool or hot tub. When the electricity consumption of the average family was analyzed, the most important factors were income, number of freezers, heating/cooling degree days and thermostat settings. As for natural gas, the factors were size of home, income, thermostat settings, whether the spouse worked, walls and product features. However, the study does not ascertain the reasons behind the variances in consumption.

0570

Burright, B.K., and J.H. Enns

1975 Econometric Models of the Demand for Motor Fuel.
(Publication No. R-1561-NSF/FEA)
Santa Monica, Ca.: The Rand Corporation.

Abstract: This report reviews recent studies of the response of motor fuel demand to price changes. Two methodologies are developed for estimating short-run and long-run demand relationships. Empirical estimates are set forth using both national and state pooled time-series data and are compared with those of other recent studies. It is found that the first-year elasticity of highway motor fuel use with respect to real price is low -- probably between -0.1 and -0.3; however, the long-run elasticity is higher -- between -0.60 and -0.85. Higher gasoline prices would cause new car sales to drop temporarily, but improved new car fuel efficiency could stimulate sales and offset some of the decline. A 10% increase in real gasoline price would cause a 2 to 3% decline in long-run automobile ownership. A given percentage increase in fuel efficiency would not cause a commensurate decrease in fuel use.

Buttel, Frederick H.

1977 Agricultural Structure and Energy Intensity: A Comparative Analysis of the Developed Capitalist Societies.

Paper presented at the annual meeting of The Rural Sociological Society, Madison, Wisconsin, September.

Objective: To test the hypothesis that energy use in the agricultural production sector is of great importance in shaping the overall energy intensity of developed capitalist nations

Method: UN-type data is analyzed for 25 "developed market economies" (as defined by the United Nations) for 1965. Four indicators of agricultural organization -- agricultural composition of the labour force and economy, mechanization and average farm size -- are deduced and their product-moment correlations established.

Variables: The effect of the percentage of the labour force in agriculture, agricultural share of GDP (gross domestic product), mechanization and average farm size on energy intensity in 25 developed capitalist societies

Findings/implications: The four indicators of agricultural structure are found to be highly intercorrelated. Agricultural composition of the labour force and economy proved to be inversely related to energy intensity, while mechanization and average farm size were positively related. The agricultural share of the GDP was the agricultural structure variable most closely associated with energy intensity. It had substantial direct effects on the dependent variable when per capita GNP (gross national product) and urbanization were held constant. The multivariate impacts of the other agricultural structure variables were less clear because of multicollinearity and parameter estimation problems. The author concludes that agricultural structure seems to have broad implications for resource/energy use in developed capitalist societies, extending far beyond resource use in the agricultural production sector itself.

Buttel, Frederick H.

1978 Social Structure and Energy Efficiency: A Preliminary Cross-National Analysis.

Human Ecology, Vol. 6, 2, 146-64.

Objective: To study the bivariate and multivariate associations of several structural characteristics of world nation-states with energy efficiency

Method: The study is based on a survey of 118 nation-states and a subsample of 25 nation-states with developed market economies. The data are taken from Taylor and Hudson (1972), World Handbook of Political and Social Indicators based on UN-type data for 1965. The cross-national analysis employs multiple correlation and regression analysis of the ratio of gross national product to total inanimate energy consumption.

Variables: Dependent: energy efficiency (a ratio of gross national product to total inanimate energy consumption)

Independent: gross national product per capita; gross domestic product from agriculture; labour force; urbanization; military expenditures; size; population density

Findings/implications: The level of production, division of labour outside the agricultural sector and population density exhibit substantial inverse relationships with energy efficiency. The main indicator of energy efficiency is the gross national product per capita. Territorial size bears little bivariate relationship to the cross-national patterns, but proves to have a discernible inverse relationship at the multivariate level. Levels of urbanization and defence expenditures have substantial bivariate relationships, but only small multivariate relationships. The main indicators of energy efficiency are gross national product, the labour force and the gross domestic product associated with agriculture. The results indicate that there is a need for "de-development" in terms of repopulating rural areas and reducing the flow of energy. However, this should not reduce the gross national product as this is the main indicator of energy efficiency.

0805

Cambridge Systematics Inc.

1979 Interim Evaluation of the Minneapolis Ridesharing Commuter
Services Demonstration.

Springfield, Virginia: National Technical Information Source.

Abstract: This report presents an interim evaluation of the impacts of ridesharing brokerage at three multiemployer work sites in the Minneapolis metropolitan area. In this demonstration, the Metropolitan Transit Commission coordinates a variety of brokerage functions which are designed to encourage increased ridership in high occupancy vehicles to non-Central Business District work sites. The modes being promoted are carpooling, vanpooling, subscription and regular bus.

This evaluation focuses on an analysis of pre-demonstration survey data. Site characteristics and work conditions are described in detail, including parking availability, observed variance in start-end times, worker overtime requirements and business need for a car. It is shown that these work conditions and the relatively short commute distances to the demonstration site impose major barriers to successful demonstration results. A series of market penetration measures are presented to evaluate the effectiveness of the broker's marketing efforts. The results suggest that formal employee presentations are much more effective than passive marketing tools in attracting commuter interest in ridesharing.

0810

Camm, F.A.

1978 Average Cost Pricing of Natural Gas: A Problem and Three Policy Options.

(Publication No. R-2282-DOE)

Santa Monica, Ca.: The Rand Corporation.

Abstract: Current regulation of wholesale and retail natural gas encourages overconsumption of gas and discourages use of solar heaters, heat pumps and other "new" residential and commercial energy technologies. This report uses the tools of public finance to compare the desirability of three alternative policies with that of current regulation. The alternatives include marginal cost pricing with consumer compensation, average cost pricing with taxes and/or subsidies, and utility ownership of new energy technologies.

0815

Carrington, A. David

1977 A Report on the Potential of Consumer Animation for Energy Conservation.

Saint John, New Brunswick: Community Planning Association of Canada.

Abstract: The report examines the work of the "Pilot Diffusion Project," an experiment in community participation in energy conserving activities in Saint John, New Brunswick. The project began in February 1977 and ended four months later. Its objectives were to test the acceptability of various approaches to community group animation and to assess the effectiveness of these approaches. The approaches and findings were as follows. (1) Material and literature were surveyed and organized for reference. There is a need for a uniform series of pamphlets organizing material into broad groupings. (2) The personal contacts approach had positive results. (3) The results of school visits were negligible. (4) Liaison with similar programs yielded two seemingly fruitful contacts. (5) The results of carpooling were poor or negligible. (6) Employee contact at work may be worthwhile. (7) Three public meetings were held, with attendance of 35, four and three persons. (8) Some personal contacts were made at a display table at public fairs. (9) Contact with housing groups, specifically co-ops, was very encouraging. Most consumers seemed ready to commit themselves to energy conservation, but lack of cohesion in neighbourhoods is a barrier to group animation. Synergistic effects in promoting energy conservation do show some potential.

Cartee, Charles

1976 Solar Energy Installations: Trends and Lender Attitudes.
 Journal of Property Management, 41, 1 (January-February), 21-28.

Objective: To examine the attitudes of lender institutions towards solar heating and cooling

Method: A marginal frequency analysis was carried out of the attitudes of representatives of lending institutions towards solar heating and cooling of residences and the feasibility of advancing funds for this, based on a questionnaire survey (N=300).

Variables: Lender attitudes towards solar heating and cooling with respect to fuel savings, reliability, insurability of home, etc., as well as their feasibility for purposes of finance

Findings/implications: Nearly three-fourths believed solar energy would represent a feasible alternative energy source for the heating and cooling of single family residences during the next ten years. Financiers indicated a preference for making loans on solar homes. Concern was expressed about the expected life of solar equipment and the associated maintenance costs.

0825

Carter, Lewis

On- Interactive Monitoring System for Evaluating Energy Policy
going Effects on Private Nonindustrial Consumption.
Washington State University: Social Research Center.

Objective: A longitudinal study of consumer energy conservation

Method: A continuously updated interactive data retrieval system was established to monitor consumer energy conservation and the effects of energy shortages and policies. A rotating panel design was used, with six panels selected each year from a random area stratified sample (N=300) of Washington state residents. Differences in matched time-lag changes, displacement of time-series data and perturbation within specific periods are examined. Data are from utilities, interviews and questionnaires.

Variables: Changes in consumer conservation attitudes and behaviour pursuant to changes in energy policy and availability

Findings/implications: Not yet reported

0830

Carter, Lewis

1977 On the Public "Need to Know" Concerning Energy Policy Alternatives.

Pullman, Washington: Social Research Center, Washington State University.

Abstract: This report: (1) indicates what information the public may need for informed democratic participation or for reasons of personal solvency; and (2) provides illustrations of the information available. The public must be told that the United States needs to produce more energy domestically and/or use less and that this fact is the basis for the shortages dislocating American life. The consumer sense of equity would be increased greatly by public disclosure of use rates in the various sectors (military, agricultural, industrial, individual) and indications of the degree of conservation in each sector.

The individual sector uses 34% of all energy consumed; 76% of that is for personal travel and space heating. Concerted conservation/efficiency thrusts in the individual sector should thus be directed at these two points. Long-term changes are preferred to short-term changes: they result in larger savings; they are less reversible; and they make the inconvenience of short-term changes less necessary.

Policies aimed at the personal travel sector include: increasing the use of mass transit from 4% to 40% (saving 2.8% of total fuel use); eliminating tourism (1%); maximizing existing automobiles' efficiencies (1%); and banning Sunday driving (1.5%). A more viable policy, and one that would save more energy, would be to increase the efficiency of the automobile fleet. Policies required in the personal travel area include: an education program concerning where fuels are used and how they may be conserved with minimal lifestyle disruption; and serious tax incentive/penalty systems to motivate the use of efficient automobiles.

Space-heating energy requirements make up 38% of personal use and 13% of total energy use in the northwest United States. Every effort should be made to provide use information and feedback to occupants of dwellings by invoking these policies, among others: forbidding renting on a "utility paid" basis; establishing retrofitting standards for landlords; banning averaged payments plans of utility companies; and establishing thermal disclosure rules to be followed when renting or selling dwellings.

Carter, Lewis (cont'd)

In short, the public needs honest assessments of the inconveniences vs. efficiencies that can be affected by different practices, rather than the misguided exhortations to save energy in ways which have only token or symbolic significance. They also need incentives to make efficiency attractive, financing to make it possible and feedback so that it might be monitored.

Cesta, John R., and Patrick G. Decker

1978 Speeding Solar Energy Commercialization: A Delphi Research of
Marketplace Factors.
Journal of Business Research, 6, 311-328.

Objective: To collect opinions on the market's receptiveness and determine the significant barriers related to the solar energy concept and products for the current situation through 1987

Method: Questionnaires were mailed to 660 users/sellers/producers of solar related products; 216 responded. This questionnaire was used to identify demand stimulating and inhibiting factors. A second questionnaire, focusing on these factors, was mailed to the original respondents, 147 of whom provided usable responses.

Variables: Survey I: demographics; solar energy knowledge; solar energy purchase behaviour; perceptions of factors inhibiting/stimulating current/future demand for solar energy products

Survey II: perceived importance/likelihood of factors stimulating/inhibiting current/future demand; recommended government actions to speed commercialization; likelihood of government taking such action

Findings/implications: In Survey I, the largest inhibiting factor in terms of current demand was high initial costs (mentioned by 68% of respondents). Other important factors were lack of information available (45%) and poor quality (28%). Stimulating factors included the high cost of energy (74%) and favorable publicity (27%). In Survey II, the perceived importance and likelihood of the factors affecting future demand were high energy costs (importance, 96%; likelihood, 86%); increased quality (77%, 66%); favourable publicity (73%, 60%); high initial cost (79%, 70%); lack of support from government (53%, 60%); poor quality (62%, 50%). The three actions seen as necessary for government were funding research and development, public education and tax incentives. Respondents felt there was only a 50% chance that such actions would be taken. Business actions perceived as required included research, educating the public and reducing prices.

0840

Charpentier, J.P., and J.M. Beanjean

1976 Toward A Better Understanding of Energy Consumption. II. Factor
Analysis: A New Approach to Energy Demand.
Energy, 1, 4 (December), 413-428.

Abstract: The relationship between energy consumption and lifestyle standards is not yet fully understood. Major studies in this field have failed to consider variables other than the gross national product. This article attempts to obtain a better understanding of the complex interface of lifestyle and energy consumption. Factor analyses to quantify the relation between energy use and economic development have been performed for 35 developed countries and 15 OECO countries. The authors state that their measures of the relation between degrees of development and energy consumption may prove to be of more general applicability for forecasting than the widely used correlation between per capita energy consumption and per capita GNP.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

0845

Childress, R.B.

1977 Preliminary Investigations of Energy Education/Conservation Attitudes of a Selected Group of East Tennessee Educators.
Journal of Tennessee Academy of Science, 52, 4 (October), 127-131.

Abstract: A major responsibility for changing present energy resource utilization and conservation attitudes and practices rests with the public education system. To date, few research efforts have been focused on determining the attitudes of public school elementary and secondary teachers in the area of energy education/conservation. In the spring of 1975, 75 elementary and secondary school teachers from the Kingsport City School System were surveyed concerning their attitudes relative to six major aspects of energy education/conservation. Conclusions pertinent to each area are presented.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Claxton, John D., and C. Dennis Anderson

1979 Energy Information at the Point of Sale: A Field Experiment.
In Jerry C. Olsen (ed.), Advances in Consumer Research, vol. VII,
Proceedings of the 10th Annual Conference of the Association for
Consumer Research, San Francisco, California.

Objectives: To investigate : (1) the initial impact on consumers of Canada's new energy labelling program for major appliances, Energiguide; and (2) the role of the retail sales force in providing energy information and influencing consumers' appliance decision-making process

Method: The experiment took place at 12 stores in western Canada (six others were monitored for control purposes. There were four treatments (2x2 design). Consumers who purchased refrigerators during the experiment (720 in all) were mailed a questionnaire which collected post-purchase information (the response rate was 42%). As well, sales personnel were surveyed upon completion of the experiment.

Variables: Dependent: refrigerator chosen, importance of product characteristics when choosing refrigerator, consumer decision-making style; importance of energy information to salesperson

Independent: treatments (2x2): information label format (kilowatt hours or dollars), degree of sales force emphasis on energy (no sales push or sales push)

Findings/implications: This paper does not present an analysis of treatment effects. The findings indicate that potential savings to consumers, and to the nation in terms of energy saved, of having consumers buy more energy-efficient refrigerators are substantial. Energy information was not considered particularly important by consumers in making their product choice. "Operating costs of electricity" was ranked 15th of 19 product characteristics in terms of importance when making the product choice. Only 26% thought there were major differences in energy consumption from model to model, but 92% thought the government should embark on an energy labelling program for major appliances. Based on responses from consumers, 44% were judged to be "independent" purchasers (did not accept aid from salesperson), 27% to be "aided" (accepted information and then made their own decision), and 29% to be "dominated" (abdicated their decision to the sales person). Salespeople felt generally that consumers were not interested in energy information. Trained shoppers used in the experiment found that salespeople used the energy information provided about 47% of the time.

A model (IMPACT) was derived to assess alternative initiatives to maximize consumers' response to Energy Information at Point of Sales (EIPS), depending on the decision style

Claxton, John D., and C. Dennis Anderson (cont'd)

(independent, etc.), importance of operating costs in refrigerator choice, and exposure to and understanding of the energy labels. Four types of initiatives were identified by the model: (1) education of retail salespeople (this alternative has the greatest potential); (2) changing consumer attitudes energy labels more obvious; and (4) helping consumers more fully understand the labels. The labels alone are likely to have only a minimal impact without other point of sale information, most of which should come from an informed and motivated retail sales staff.

Cohen, Reuben

1976 Setting Equitable National Goals for Household Energy Conservation.

Paper presented at the annual meeting of the American Sociological Association, New York, August.

Objective: To determine the major factors which affect energy use by households

Method: Two specific conservation levels or targets for electricity and natural gas were studied. These conservation targets are based on an analysis of the distribution of energy consumption by households in the United States. Data were obtained through personal interviews from a May-June 1973 national probability sample (N=1,500) of households. Low-income households were oversampled and weighting procedures were used to compensate for the disproportionate sampling. Data were also obtained from utilities for one-third of the sampled households. A multiple regression analysis was performed.

Variables: The effects of household and climatic characteristics on consumption of natural gas and electricity; the potential for energy conservation in relation to specific targets based on the effects established

Findings/implications: About one-third of the variation among households was explained by factors including size of household, use of fuels for such essentials as hot water and cooking, and climatic conditions. The top-income group used about 50% more natural gas and 160% more electricity, on a per household basis, than the lowest. The author relates these findings to target #1 (that U.S. households consume no more energy than the average reported in 1972-73 for households with these characteristics) and finds that 18% of electricity and 13% of natural gas consumption could be conserved. Overall, the biggest per-household share of the savings would have to come from upper-income groups. Target #2 (that households occupy no more than the median number of rooms reported for households of the same numbers of persons, and consume no more energy than the average reported for households of that type) would entail a similar saving, requiring a disproportionate reduction by the upper-income groups relative to lower because of the more discretionary expenditure for living space at upper-income levels.

0860

Collins, Lynn D.

1976 Social Comparison and Objective Standard Feedback as Means of Reducing Residential Energy Consumption.

Ph.D. dissertation, George Washington University.

Objective: To examine the effectiveness of social comparison and objective standard feedback as means of reducing residential energy consumption

Method: Seventy-eight subjects were assigned to one of four groups: (1) social comparison, in which daily feedback was received on relative standing with regard to gas consumption; (2) objective standard, in which daily gas consumption was compared to an objective physical standard; (3) clock, with no feedback given but daily consumption monitored; and (4) control, with consumption monitored weekly. A post-test questionnaire was administered to all subjects.

Variables: Dependent: weekly gas consumption (for seven weeks)

Independent: treatment

Findings/implications: The gas consumption of the social comparison group was not significantly lower than that of the others. The lack of significant results is considered to be because of a ceiling effect in terms of conservation. Subjects had earlier reduced their gas consumption by 14%, as a result of measures taken due to the oil embargo of 1973. The reduction was due in part to the presence of Princeton University researchers (Becker et al.) who were studying the effects of feedback on energy consumption. It is considered unlikely, however, despite the results obtained, that social comparison theory is inappropriate for the problem of energy conservation.

Collins, Thomas A., et al.

1979 Establishing Positive Attitudes Toward Energy Conservation in Intermediate-Level Children.
 Journal of Environmental Education, 10, 2 (Winter), 18-23.

Objective: To establish positive attitudes towards conservation and wise use of energy resources by presenting key principles regarding energy and the environment to intermediate-level school children

Method: Subjects were 431 fourth- through sixth-grade students from Preble County, Ohio (plus 53 in a control group). Students were administered an attitude questionnaire pre- and post-test. Treatment consisted of a nine-day field trip in April 1978, during which energy principles were taught and reinforced. Actual design consisted of three different contexts, two energy principles for each context, and three learning activities for each principle.

Variables: Dependent: change in attitude

 Independent: treatments (contexts -- past, present, future); principles (energy sources, net energy; trophic levels, recycling; energy conservation, second law of thermodynamics); activities (18 in all); grade level; sex; community type

Findings/implications: The experimental group increased its score 17.5% on the post-test. The control group did not show any significant changes, nor was there a significant difference between control and experimental groups on the pre-test. No significant differences were found regarding sex, grade or community type. Older children tended to change attitudes to a greater degree than younger children. It is not known if the attitude changes would be long lasting, but it is speculated (based on other research), that they would. An understanding of basic energy principles, it is concluded, can lead to an establishment of new attitudes.

0870

Committee on Science and Technology

1977 Energy Demand, Conservation Potential, and Probably Lifestyle Changes.

Hearing before the Subcommittee on Advanced Energy Conservation Research, Development and Demonstration, U.S. House of Representatives, Ninety-Fifth Congress.

Abstract: The hearings on April 4 and 5, 1977 were conducted to lay groundwork for pending energy legislation and technology proposals facing the subcommittee. Of particular interest are the differences in energy demand forecasts, the potential for conservation and the lifestyle changes that may result between now and the 21st century. Many of the witnesses made forecasts of energy needs over the next 25 years. Each forecast implies some level of annual energy growth rate and conservation, both implying lifestyle or quality of life changes forced either by price increases or regulations or both. Witnesses appearing on April 4 were Drs. Chauncy Starr, Gene G. Manella, John D. Christie, Joel Darmstadter, Richard W. Barnes and Denis A. Hayes. Drs. John H. Gibbons and William W. Hogan and Prof. Lawrence R. Klein were the witnesses on April 5.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

0875

Connecticut Power and Light Co.

1976 Hartford, CN, Experimental Study.

Reported by the Associated Press in the New York Times, Saturday, August 21.

Objective: To determine if home users of electricity would change their lifestyle to reduce their power bills

Method: This year-long experiment began October 16, 1975 and entailed 239 residential customers of Connecticut Power and Light, representing a wide range in level of demand. Of these, 40 constituted the control group. Each home was outfitted with a meter to record use during 15-minute segments. Subjects were charged a much higher price during peak demand periods and a reduced rate during power lulls. Charges were, respectively, 16 cents and 1 cent a kilowatt-hour, with 3 cents a kilowatt-hour being levied the rest of the day, on weekends and designated holidays. These rates were applied in from January to March 1976.

Variables: The effect of pricing incentives and disincentives on peak period use of electricity by residential customers

Findings/implications: Few customers in the experimental group significantly changed their power use during the warmer months, but nearly all used less electricity during peak periods in winter than did the control group or the average company customer.

0880

Consumers' Association

1978 Energy Efficiency Labelling.

Report prepared for the Department of Energy (U.K.).

Objective: To assess the likely effects on U.K. consumers of the proposed EEC energy-efficiency labelling scheme

Method: A stratified sample of 498 people was surveyed in May 1977.

Variables: Knowledge of appliance energy usage, factors taken into account in making a major appliance (refrigerator) purchase and opinions on the energy label concept

Findings/implications: Generally, respondents: (1) overestimated the running costs of appliances; (2) made no attempt to relate electrical charges to use of their own appliances; (3) did not feel there are any differences in running costs between different brands of same appliances (when in fact there are); and (4) severely underestimated costs of electrical central heating.

The main factors taken into account in making a refrigerator purchase include exterior dimensions (mentioned by 42% of respondents), capacity (31%) and price (27%). Running costs were mentioned by only 5% of respondents. A simulated purchase of a washing machine revealed that saving £10 per year in electricity costs was ranked fourth in importance as a reason for choosing a particular brand (after most reliable, washes cleanest, good repair service). Most respondents (91%) felt that energy efficiency labelling would be useful.

National savings could range from £179 million to £466 million per annum if consumers purchased the more energy-efficient appliances.

A labelling scheme should be extended to include all fuels, not only electricity. Energy labelling would be used if consumers understood the information. Labelling could encourage manufacturers to consider consumption in appliance design.

0885

Contemporary Research Centre

1975 A Study of the Canadian Public's Attitudes Toward the Energy Situation in Canada, Wave I.

Conducted for Energy, Mines and Resources Canada.

Objective: To examine Canadians' attitudes towards the energy crisis and possible government interventions

Method: Telephone interviews were conducted in seven Canadian cities with 1,821 people over the age of 15.

Variables: The study measures Canadians' attitudes, behavioural intentions and behaviour with respect to energy

Findings/implications: Only 8% of the sample spontaneously mentioned energy as a problem facing Canadians. Only 46% of the sample judged the energy crisis as "very" or "somewhat serious." One out of four respondents felt that a gasoline shortage was imminent within the next five years. Almost nine out of ten believe individual efforts to conserve energy can be of some importance; however, the likelihood that individuals will cut back on energy consumption is seen as remote. Respondents prefer voluntary conservation to legislated controls. The majority would like to see the government act in an advisory capacity in the energy situation.

0890

Contemporary Research Centre

1976 A Study of the Canadian Public's Attitudes Toward the Energy Situation in Canada, Wave II.

Conducted for Energy, Mines and Resources Canada.

Objective: To examine Canadians' attitudes and behaviour in response to the energy situation and possible government interventions

Method: Telephone interviews were conducted in seven Canadian cities with 1,840 people over the age of 15.

Variables: Canadians' attitudes, behavioural intentions and behaviour with respect to energy

Findings/implications: More than six out of ten judged the energy shortage as "very" or "somewhat serious." The majority of subgroups indicated increased concern over the energy situation in comparison with Wave I. Most Canadians surveyed believed gasoline and heating oil shortages were likely. Fear of short-term fuel shortages has decreased since Wave I. The individual is seen as able to make a significant contribution to solving the energy crisis by nine out of ten; however, the individual is deemed likely to make this effort of his own volition. Respondents preferred voluntary conservation to legislated controls but felt that, if the government was to get involved, it should be in an advisory capacity.

The most frequently reported energy conserving behaviour reported by consumers is turning lights off more often (81% of respondents) followed by turning thermostats down (68%).

Contemporary Research Centre

1977 A Study of the Canadian Public's Attitudes Toward the Energy Situation in Canada, Wave III.

Prepared for Energy, Mines and Resources Canada.

Objective: To examine Canadians' attitudes and behaviour in response to the energy crisis and possible government interventions

Method: Telephone interviews were conducted in seven Canadian cities with 1,815 people over the age of 15. The sample was approximately 50% male and 50% female.

Variables: Canadians' attitudes, behavioural intentions and behaviour with respect to energy.

Findings/implications: More than six out of ten judged the energy shortage as "very" or "somewhat serious." Francophones were less likely to rate the energy situation as serious than anglophones. White-collar and professional groups showed an increased awareness of the seriousness of the energy shortage.

The majority of Canadians surveyed believed gasoline and heating oil shortages were likely. Fear of short-term fuel shortages has diminished, but the possibility of a fuel shortage in the future is seen as a more serious threat today than it was two years ago.

More than nine out of ten people feel individual efforts to conserve energy can be of some importance. However, respondents are not strongly convinced that individuals will work to cut down their own fuel consumption.

Although there is a growing proportion of people who feel that stronger measures are needed, respondents prefer voluntary conservation to legislated control; more than three out of four favour some form of voluntary conservation. The Canadian public appears to want the government to play an advisory or educational role. More than half the public surveyed was unaware of any federal energy policy. Of those who were aware of a federal energy policy, three out of four judged it as "adequate" or "poor."

Insulation is perceived as a good investment, but the public is less certain of the monetary benefits. Despite this uncertainty, increased numbers of respondents are adding insulation to their homes and six out of ten are planning to have their insulation checked.

Two out of three people surveyed expressed concern that the energy situation would affect the quality of Canadian life, but respondents were confident that technology change, combined with a changed lifestyle, would ultimately solve the

Contemporary Research Centre (cont'd)

the energy problem. Young people, the better educated, and the francophones were least pessimistic about any possible negative effects of energy conservation on living standards and employment.

The blame for oil and gas increases of recent years is primarily attributed to the Arabs and oil company profits.

Respondents claimed to be actively involved in a variety of efforts to conserve energy. The most often reported actions taken by Canadians are: turning off lights more often (88% of the sample), keeping thermostats down (77%), using returnable bottles (76%), turning to public transportation (61%), taking better care of one's car (60%), using less hot water (54%) and servicing furnaces a minimum of once a year (51%). Personal efforts to conserve energy are more likely to be initiated by anglophones than francophones. Rationing and taxes are unpopular conservation methods. Gasoline is seen as the most likely source of energy to be conserved.

Seven out of ten respondents claimed they would be willing to increase their initial expenditure on an appliance to save energy. More than eight out of ten claimed a car's gas mileage is of some importance to them when buying a new car.

0900

Contemporary Research Centre Limited

1977 Study of a Qualitative Study on Energy Efficiency Label Designs.
Prepared for Consumer and Corporate Affairs Canada.

Objectives: (1) to evaluate four alternative label designs in order to choose one for use on refrigerators; (2) to explore consumers' attitudes towards energy conservation in general and energy consumption of appliances in particular; and (3) to explore factors considered important by consumers in making a major household appliance purchase decision

Method: Six group discussions -- three in English in Toronto and three in French in Montreal -- were held. A total of 30 couples were involved drawn from three groups: (1) potential first-time refrigerator purchasers; (2) potential repeat purchasers; and (3) recent purchasers. General discussions on energy conservation and energy usage by appliances were held, and participants answered specific questions about energy usage of refrigerators relative to other household appliances. Individuals ranked the four energy labels presented. Labels gave the same information but had different shapes and layouts.

Variables: Dependent: label chosen, ranking of refrigerator's energy usage relative to that of other household appliances, criteria used to select refrigerator model, attitudes towards energy conservation

Independent: group (see above), anglophone/francophone

Findings/implications: Refrigerators were not perceived as heavy energy users (ranked third to fourth among six items, when they were actually first). Energy consumption was mentioned as a criterion in the choice of refrigerator model by one or two people of 60. Little difference between the various models in terms of energy usage was perceived. The country's need to conserve energy was not seen as great; in fact, there was doubt that an energy crisis existed. Any incentive to conserve was purely financial -- motivated by the desire to save money. No conclusive choice between the four label designs was made. However, one, an elliptical shape, appeared to be clearly not preferred by both francophones and anglophones. A strong need exists for an introductory publicity or promotional campaign for the Energuide Program, stressing the importance and relevance of the scheme. The Energuide concept encountered no reverse negative attitudes among the target groups.

0905

Cook, Stuart W., et al

1976 Encouraging Energy Conservation in Master-Metered Buildings.
through Ongoing study at the University of Colorado, September 1976
1977 through June 1977.

Objective: An experiment on how to encourage occupants to conserve energy when they do not directly pay their energy bills

Method: A management method and a user method, the former involving a leader and the latter occupant participation, are to be contrasted in four pairs of University of Colorado office-classroom buildings and in three pairs of dormitories. In a second study, one of a pair of married student apartment complexes will institute a program of rewards (lottery tickets) for residents found in random checks to have their thermostats set below a specified level. The second complex will serve as the control. Actual use after implementation will be compared with predicted use through multiple regression.

Variables: The effect of management and user-oriented methods on energy consumption by occupants of master-metered office and residential apartment buildings

Findings/implications: Not yet reported

0910

Cook, Stuart W., et al.

1976 A Comparison of Three Methods of Encouraging Homeowners to
through Install Insulation.

1977 Ongoing study at the University of Colorado, September 1976
through February 1977.

Objective: To determine what type, or combination of types, of persuasive communication is most effective in encouraging homeowners to install attic insulation

Method: The subjects are firemen who own homes in the Denver metropolitan area. Either 2x2x2 analyses of variance or Chi-square analyses are used to evaluate attitudes and behavioural intentions, acceptance of insulation inspection and actual installation of insulation.

Variables: The effect of seven types of communications (e.g., an energy crisis appeal or an economic appeal) on subjects' willingness to install insulation

Findings/implications: Not yet reported

0915

Corr, Michael, and Dan MacLeod
1972 Getting It Together.
 Environment, 14, 9 (November), 2-10.

Objective: To study an alternative lifestyle and its effect on energy consumption

Method: A 1972 study of energy and lifestyle, using a questionnaire on energy consumption habits, was administered to 12 communes in the Minneapolis area totalling 116 members.

Variables: The effect of commune living on consumption of natural gas, electricity and gasoline, and on energy use in appliances and automobiles

Findings/implications: Communal lifestyle appears to make a pronounced difference in personal energy consumption compared with the average for households nationally and, in some cases, for the Minneapolis area.

Corr, Michael, and Dan MacLeod

1975 Home Energy Consumption as a Function of Life-Style.

In Commoner, Boksenbaum and Corr (ed.s), Energy and Human Welfare
-- A Critical Analysis. Vol. III., Macmillan Information, New
York.

Objective: To discover if a lifestyle which leads to communal use of facilities will make a pronounced difference in personal energy consumption

Method: Questionnaires were administered to 116 members of 12 communes in the Minneapolis area. The sample was not selected in a random fashion, and measurement of some of the consumption involved making rough estimates.

Variables: Appliance ownership; appliance saturation; energy usage (gasoline, electricity, natural gas, fuel oil); vehicle ownership and mileage; energy used specifically for space and water heating

Findings/implications: About 25% of Minneapolis homes had airconditioners, but the communes had none. There were also no dishwashers or food freezers, and only two clothes dryers (one-eighth the national average). The average per capita saturation for 19 appliances on a national basis was 24%, while for the communes it was only 6%. Altogether, the savings of energy by commune individuals amounted to 19.3% of total U.S. national per capita energy consumption. Gasoline consumption per capita was 36% below the national average, and mileage per individual was 68% below. The communes used 40% less gas and 82% less electricity per individual than comparable Minneapolis families. Attitudes towards energy use in the home seem to be closely tied to cultural attitudes about comfort and leisure. Domestic energy needs are not necessary absolutes but are based to some extent on decisions of taste and culture.

Corsi, Thomas M., and Milton E. Harvey
1977 Travel Behavior Under Increases in Gasoline Prices.
Traffic Quarterly, 31 (October), 605-624.

Objectives: To investigate: (1) the changes in household travel behaviour caused by the continuing increases in fuel prices; (2) the price level at which the majority of households will make travel changes; (3) the relationship between gasoline prices and the types of strategies households may employ to ease a situation; and (4) the relationship between a household's behavioural intentions and actual behaviour.

Method: A questionnaire was mailed to 9,881 persons in southeast Wisconsin during November 1975. 1,461 usable responses were obtained.

Variables: Dependent: adjustments reported in travel behaviour since gasoline price increases began in 1973; intentions regarding further adjustments in response to further price increases; intentions regarding adjustments to potential restrictions; attitudes regarding existing or prospective transportation facilities and costs

Independent: demographic and economic attributes of the household

Findings/implications: At a price of 50-59¢ per gallon, only 10% of respondents indicated that their travel behaviour would change significantly. At 80-89¢, 82% would change their behaviour, and at \$1 or more 100% would change. Attempts to induce a conservation would probably be effective only if a large proportion of the population was willing to change behaviour. The threshold level (price at which travel behaviour would change) is significantly related to the age of the household head (negatively), income (positively) and education (positively). As well, households that do not own small cars tend to have lower thresholds than households that do. There is also a significant relationship between thresholds and gasoline policy preferences (three were presented). Those with low price thresholds prefer rationing schemes to those which increase prices. Those with higher thresholds prefer higher prices to either rationing or a combination of rationing and price increases. There appears to be a pyramidal hierarchy of strategies employed by households to cope with increases in the price of gasoline. Households initiate their own individual strategies when they encounter a stress situation. Any fuel policy must consider ways for helping the most seriously affected subpopulations in the interests of social equity.

0930

Craig, C. Samuel and John M. McCann

1977 Communicating Energy Conservation Information to Consumers: A Field Experiment.

American Marketing Association Proceedings, Series No. 41, 432-436

Objective: To test alternative information strategies' effects on consumers': (1) interest in learning about energy conservation; (2) intentions to conserve energy; and (3) actual consumption behaviour

Method: A field experiment was carried out involving 2,000 residential consumers of electricity in the Con Edison service territory who consumed more than 5,000 kilowatt hours per year and whose July-August consumption was at least 20% higher than for the period December-January.

Variables: Dependent: consumers' interest, intentions, actual consumption

Independent: source of communication, channel used to communicate, nature of the appeal

Findings/implications: None of the experimental manipulations was successful in getting consumers to reduce their actual consumption of energy. The combined communication factors frequently resulted in a significantly greater conservation intention than the control group, which received no communication. In summary, this study indicates that feedback communication often results in consumer interest and intention changes, but not in actual consumption changes.

Craig, C. Samuel and John M. McCann
1978 Assessing Communication Effects on Energy Conservation.
 Journal of Consumer Research, 5 (September), 82-89.

Objective: To determine the effect of one and two repetitions of a message containing energy conservation information

Method: Subjects were 1,000 Con Edison customers, randomly assigned to four experimental groups and one control group. Criteria for inclusion in the sample were: use of 5,000 kwh per year per household; July-August consumption at least 20% above that for the December-January period; and all meter reading and billing done on the same day. Communications were mailed out in August. Meters were read in September and October.

Variables: Dependent: number of subjects who returned the card, amount of electricity consumed for two months after receipt of communication

Independent: source of communication (the communication, describing 11 ways to reduce air conditioner electricity consumption, was identified as coming either from Con Edison or the New York State Public Service Commission); the communication, included in the bill with a postage-paid return card that subjects could send in to receive a booklet on ways to control an electric bill; repetition, achieved by sending some consumers the same communication in two consecutive bills (one month apart)

Findings/implications: The source of the communication had a significant effect on the requests for information, but the repetition did not. The Public Service Commission messages had an 18% response rate, compared with a 10% rate for the Con Edison messages. Both messages (August and September) generated a 14% return rate. Neither the source nor the repetition had any significant effects on actual consumption. It may be, however, that the drop in temperature over the period of the experiment negated any of the experimental effects. The act of returning a card in the mail may not be an indication of a willingness (or unwillingness) to conserve energy.

0940

Craig, C. Samuel and John M. McCann

1978 The Impact of Persuasive Communications on Energy Conservation.
Energy Systems and Policy, 2, 4 (April), 433-447.

Objective: To test the viability of alternative information strategies on consumers': (1) interest in learning about energy conservation; (2) intention to conserve energy; and (3) actual conservation behaviour

Method: Subjects were 2,400 Con Edison customers, randomly assigned to 12 experimental groups of 200 each (2x2x3 design). Criteria for inclusion in the sample were: use of 5,000 kwh per year per household; July-August consumption at least 20% above that for the December-January period; and all meter reading and billing done on the same day. Communications were mailed out in August. Questionnaires (398 returned) were later distributed to all subjects.

Variables: Dependent: number of subjects who returned the card, subjects' intention to conserve energy, amount of electricity consumed during the month following receipt of the communication

Independent: two appeals ("save dollars" and "independence"); two recommendations ("easy ways" and "ventilate"); three sources (Con Edison, New York State Public Service Commission, Cooperative Extension). Each communication contained a postage-paid return card that subjects could mail in to receive a booklet on ways to control an electric bill

Findings/implications: The source and appeal did not have a significant effect on the request rate, but the recommendation did. The "ventilate" recommendation had an 11.1% request rate, while the "easy ways" had a 7.8% rate. This may be because the information contained in the latter had appeared previously in Con Edison bill enclosures. None of the main effects were significant regarding the subjects' intention to conserve. The source by appeal interaction was significant, indicating that the effectiveness of a particular appeal depends on the source. In terms of actual consumption, the "ventilation" subjects used 18.3 kwh less during August than did "easy ways" subjects (marginally significant). No differences were attributable to either the source or the appeal. Results suggest that properly designed persuasive communications can alone effect conservation behaviour. Utilities should perhaps give more thought to the nature and substance of their bill enclosures.

Crossley, David J.

1979 The Role of Popularization Campaigns in Energy Conservation.
Energy Policy, 7, 1 (March), 57-68.

Abstract: Energy conservation popularization campaigns have been used to induce people to reduce their energy usage. Many such campaigns have been sponsored by governments, sometimes with negative reactions from consumers. Campaigns have usually been directed towards energy saving in the home. Industrial and transport sectors, where large amounts of energy are used, have not been the targets of campaigns to the same extent. There are three types of change strategies: (1) power strategies; (2) persuasion strategies; and (3) re-education strategies. Most campaigns are persuasive, appealing to logic -- energy savings mean financial savings. Campaigns use media influence channels (mass and specialized media) rather than personal influence channels to transmit the information. Response channels, including media responses, individual visits and actions are also less widespread. They tend to be labour and resource intensive, limiting their use. Studies need to be undertaken in conjunction with campaigns to evaluate their effectiveness. Government-sponsored campaigns should be part of a comprehensive energy conservation program which is itself part of a well-planned energy policy.

0950

Crow, R.

1977 Energy Conservation: Behavioral Considerations.
Electric Power Research Institute Journal, 2, 5 (May), 20-25.

Abstract: Technological and social means have been advanced to reach the objectives of energy conservation. An evaluation of the societal and economic impacts has been lacking, but now research is being carried out by Electric Power Research Institute Energy Demand and Conservation Program to investigate such behavioural factors. EPRI uses data about economic variables, technological change and performance, and market restrictions to assess this issue.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Cunningham, William H., and Brondel Joseph

1978 Energy Conservation, Price Increases and Payback Periods.
In H. Keith Hunt (ed.), Advances in Consumer Research, Vol. V.
Proceedings of the Eighth Annual Conference of the Association
for Consumer Research, Ann Arbor, Michigan.

Objective: To examine: (1) consumers' responses to price increases in gasoline and electricity; and (2) consumers' willingness to accept various payback periods for investments in insulation and solar energy equipment

Method: 10,000 questionnaires were mailed to residents in five communities in the southwest United States. 2,403 usable responses were obtained.

Variables: Dependent: total annual family income (six groups)

Independent: reactions in terms of fuel use to nine price increases in gasoline and electricity varying from 5% to more than 150% (six categories from "no reduction" to "would no longer use"); maximum time acceptable to re-cover various levels of investments in insulation and solar energy equipment through savings in energy bills (six categories from "less than one year" to "more than eight years").

Findings/implications: Price increases up to 50% elicit markedly rising levels of reported conservation, but the conservation level after 50% remains fairly constant. The subjects may have viewed price increases above 50% as unrealistic. There is generally a lower price response by the low- and high-income groups, the former because they cannot alter behaviour and the latter because they choose not to. The group with a family income of less than \$5,000 per year was the least price responsive. High-income groups are not very price responsive at the lower price increases, and they do not approach the response rate of the middle-income groups until the 100% price increase. Responses to price increases in electricity were quite similar. The six income groups were significantly different in terms of their payback periods for insulation. Low-income groups have the shortest payback periods (1.5 years on a \$500 investment). It is, however, the fourth highest income group (\$15,000-\$19,000) which consistently has the longest payback period (4.5 years on \$500 investment). The relationship for all groups is linear. In terms of payback periods for solar energy, the relationship between investment and payback period is curvilinear. A similar pattern is evident with the two lower-income groups below the others, and with no significant differences among the other four groups. On the whole, consumers are not willing to wait long to recover their investment (five years for \$15,000) which means that public policy makers must consider the use of tax and income credits to encourage the adoption of energy-saving equipment.

0960

Cunningham, William H. and Sally C. Lopreato

1977 Energy Use and Conservation Incentives: A Study of the Southwestern United States.

Praeger Publishers, New York.

Objective: To investigate consumer attitudes, beliefs and behaviour regarding the energy crisis

Method: Data were collected from residents of five southwestern United States communities. Conclusions were based on 2,403 codable returns of 10,000 questionnaires mailed out in 1973. The sample exhibited a slight bias towards middle-aged white males with higher than average education and income.

Variables: Attitudes, beliefs, behaviour and behavioural intentions of residential consumers relevant to the energy problem and conservation

Findings/implications: There seems to be a great deal of homogeneity on energy attitudes. The majority of subjects -- regardless of income level, education or age -- believe that the country has an energy problem of some lasting significance and that not enough is being done by public or private sectors to solve it.

Consumers are willing to make substantial efforts to conserve energy as long as they are not forced to spend substantial sums of money or experience a negative impact on their lifestyle.

In general, those individuals who were classified as more energy-conserving were lower-income, less educated and more likely to be of a minority race or ethnic group.

0965

Cunningham, William H., and Sally Cook Lopreato

1975 Energy Consumption and Conservation: Attitudes and Beliefs in
through the Southwest.

1976 Austin: The University of Texas, Center for Energy Studies.

Objective: Statistical analysis of a fall 1975 random sample (N=10,000)
of five southwest cities.

Method: The survey was accomplished by mail questionnaire and an ex-
amination of billing records. A subsample (N=801) of all-
electric users in Austin, Texas was drawn in spring 1976.
The purpose of the study was to identify attitudes and be-
haviour across diverse groups of individuals and to relate
these findings to conservation practice incentives.

Variables: Energy attitudes and behaviour with respect to socioeconomic
variables

Findings/implications: Not yet reported

0970

Cunningham, William H., and Robert A. Peterson

1977 Market Segmentation by Gasoline Consumption Intentions.

In Barnett Greenberg and Danny Bellenger (ed.s), Contemporary Marketing Thought, 1977 Educator's Proceedings.

Objective: To provide a preliminary basis for understanding consumer attitudes and behaviour relating to gasoline

Method: A questionnaire was mailed to nearly 10,000 consumers living in the southwest states in October 1975. A response rate of 24% was obtained.

Variables: Dependent: last month's gasoline consumption

Independent: reactions to a number of increases in the price of gasoline ranging from 5% to 150% (six reactions from "no reduction" to "would no longer use gasoline"); energy attitudes; demographics

Findings/implications: Respondents were clustered into five distinct groups with regard to gasoline consumption intentions. For all groups, as the price of gasoline increased, the intended consumption decreased. For one group, the decrease was only slight. For the others, the intended consumption decrease levelled off after a 50% price increase. The two groups least responsive to price increases tended to be of higher income, higher social class and white. The most responsive group was more likely to believe that the energy crisis was contrived by the oil companies. They were also most likely to agree that the crisis had put a substantial strain on their budget. Government may have to implement policies which generate different conservation efforts in particular market segments.

0975

Curtin, Richard T.

1976 Consumer Adaptation to Energy Shortages.
 Journal of Energy and Development, 2, 1 (Autumn), 38-59.

Objective: To examine how consumers coped with energy shortages, and how the energy crisis of the winter of 1973/74 affected them.

Method: A multiple classification analysis was undertaken of a random sample (N=1,400) interview survey of family heads or spouses drawn from the 48 contiguous states of the United States during the fall of 1974.

Variables: Dependent: energy conservation behaviour, expected difficulty

 Independent: socioeconomic attributes (education, age, sex, race, income, household size, number of automobiles); residential area; energy costs and prices

Findings/implications: Two-thirds of the respondents reported that they would consume less energy in the coming years, but also indicated that this would be moderately to very difficult to attain. Price appeared to be the main motivating factor behind the conservation efforts. Only age and education affected the conservation efforts. The younger and more educated the respondent, the greater his involvement in conservation as well as his adaptation to the future situation. Also, those with larger homes, families and a greater number of cars reported more conservation. If the supply situation is perceived as stable and the government is perceived as doing a poor job of dealing with the energy situation, there is a greater tendency for respondents to conserve less. The major implications of the study are that conservation is working to a large degree, but that there is need of further viable programs to enhance the situation. Also, the government must produce a more positive perception of itself towards the consumer in order to increase conservation behaviour. Furthermore, factors concerning prices and supply must be emphasized as these tend to have a direct impact on behaviour.

1205

Davis, Donald L.

1978 Attitudes of Lansing Area Residents Toward Energy Use: Consumer Adaptations Since the Oil Embargo.
East Lansing, Michigan: School of Labor and Industrial Relations, Michigan State University.

Objective: To provide a perspective on the attitudes of Lansing area residents toward energy use, and to derive specific information on the energy usage and conservation behaviour of the residents since the oil embargo of March 1974

Method: Mail questionnaire distributed to 400 Lansing area residents; 133 were returned in usable form.

Variables: Dependent: energy usage

Independent: characteristics of user's residence: mode of transport to and from work; energy use adjustments made since March 1974; expectations regarding energy use for the next winter

Findings/implications: Users were divided into low/average/high use categories. No statistically significant differences were found between the three in terms of appliance ownership. High and low users had a high propensity towards planning changes in usage. High and average users feel they have been able to conserve; low users do not. Forty-nine % of respondents felt they had successfully reduced gas and electricity consumption since 1974. Over one-third have made significant adjustments to increase the energy efficiency of their residences, but few (less than 10%) have purchased more energy efficient appliances (including furnaces). Adjustments included adding insulation (33%), installing storm windows (40%) lowering thermostats (80%) and replacing light bulbs (35%). Slightly over half of the respondents planned to reduce energy consumption in their residence. Overall, Lansing residents appear to be fairly energy conscious. Tax incentives should be used to encourage the purchase of energy efficient durables.

Defionzo, James, and Seymour Warkov

1979 Are Female-Headed Households Energy Efficient: A Test of Klausner's Hypothesis Among Anglo, Spanish-Speaking, and Black Texas Households. Human Ecology, 7,2 (June) 191-198.

Abstract: Recent studies have hypothesized that female-headed households are less efficient in their use of energy than male-headed households because they are less disciplined and ordered than male-headed households. Multivariate analysis of energy use in 4,638 anglophone, Spanish-speaking and black Texas households indicated that, when other variables known to affect energy use were accounted for, the sex of the household head had no statistically significant independent effect on electricity consumption in any ethnic or marital status group. The implications of these findings for social organization theories of household energy consumption are discussed.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

1215

Delprato, Dennis J.

1977 Prompting Electrical Energy Conservation in Commercial Users.
Environment and Behavior, 9, 3 (September) 433-442.

Abstract: Ten men's restrooms in Eastern Michigan University were studied to determine if prompting -- the presentation of stimulus to increase the probability of a specific response -- could be used to modify energy conservation behaviour. The prompting technique used -- consisting of a poster urging that lights be shut off when the room was not in use -- proved effective in reducing unnecessary electrical consumption.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Denham, F.R., N. Fairhead and P.L. Fontaine

1977 Major Domestic Appliances and Automobile Tires: Environmental and Economic Impacts of Product Durability.
Prepared for Energy, Mines and Resources Canada.

Objective: To identify the important factors determining the selection of various appliances

Method: The study reports on a consumer survey conducted in early 1977 of over 1,600 Canadian households. In-person interviews and questionnaires were utilized.

Variables: Information about the purchase and disposal of appliances, the type of appliance involved and various demographic variables

Findings/implications: The purchase decision for microwave ovens is most highly influenced by expected useful life. This relationship was most pronounced among French-speaking Quebecers, respondents from small towns or rural areas, households with five or more people, and households earning over \$20,000. The next most important characteristics were reliability and features.

For automatic dishwashers the most popular purchase criteria were, in order, reliability, expected useful life and ease and availability of service.

Reliability is the most frequently selected desired attribute of air conditioners, with little differentiation between community or household.

The prime reasons for selecting a range were ease and availability of repair, price and reliability.

For refrigerators, reliability, features and expected useful life were most important. Reliability was most often stated by households living in rural areas, or with four or more persons, while households earning less than \$10,000 chose it less often.

There were only two reasons considered "most important" in choosing a clothes washer -- reliability and expected useful life. Reliability was selected more often by respondents who were English-speaking Quebecers, in Ontario, or in households in medium-sized cities or with four or more persons. Useful life was more frequently cited by Frenchspeaking Quebecers and households in small towns, with high incomes or consisting of only one person.

By contrast, expected useful life was chosen most often as the most important reason for selecting clothes dryers. This was most noticeable in French-speaking Quebec, the Prairie Provinces and British Columbia.

1225

Denney, W. Michael, and J. Stephen Hendricks

1979 Energy, Inflation, and Citizen Discontents: A Report on Public Reasoning About Electric Utility Policies and Nuclear Energy.
Austin, Texas: Center for Energy Studies, University of Texas at Austin.

Objectives: (1) to aid in the development of improved theories of public opinion; and (2) to bring these theories to bear on understanding how the ordinary citizen reasons about contemporary social problems

Method: A telephone survey was conducted in Austin during March and April 1979. 825 subjects were interviewed. A follow-up survey interviewed 209 of the original subjects in May.

Variables: Dependent: levels of satisfaction/dissatisfaction regarding the local electric utility, levels of policy awareness, sources of policy awareness, sources of satisfaction/dissatisfaction, salience of nuclear issues, opinions about the desirability of nuclear power

Independent: demographics

Findings/implications: The vast majority of respondents (82%) rated the quality of their utility's service as good or excellent. More people in Austin thought that rates were much higher than they should be than did in the nation as a whole (40% versus 26%). A substantial gap in public awareness in some areas concerning the utility was revealed (31% did not know the utility was city-owned). Those most aware of the utility and its policies were older, more educated and had lived longer in Austin. There was some evidence that evaluation of the utility was influenced by reactions to more specific rate policies. Data gathered on the nuclear issues was influenced by the Three Mile Island incident, which occurred during the interviewing period. Attention paid nuclear power in general and the South Texas Nuclear Project (STNP) increased at the time of the Three Mile Island incident. The follow-up survey revealed that those without a strong underlying commitment to nuclear power had a slight tendency toward increased opposition. The incident did not either increase intense opposition or reduce overall support for nuclear power. Those whose views were intensified at the time of the incident later shifted back towards weaker versions of their positions. Anti-nuclear groups tend to have a higher proportion of highly educated, female, self-proclaimed liberal Democrats than the general populace.

1230

DeHloff, John A.

1977 Public Opinion Constraints on Energy Policy-Making
Presented at Energy Use Management International Conference,
Tucson, October.

Abstract: Although the public overwhelmingly approves of energy conservation as a means of dealing with U.S. energy shortages, many of the methods being presented by policy-makers are met with outright disapproval. Any measure that seems to advocate major changes in lifestyle is disliked. Positive economic incentives meet with considerable public approval, while regulatory measures, such as rationing, or negative economic measures, such as additional gasoline taxes, are strongly resisted.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Doctor, R.D., et al.

1972 California's Electricity Quandary: III. Slowing the Growth Rate.
Prepared for the California State Assembly by the Rand Corporation.

Objective: To examine the need for, usefulness of and effects of various policies designed to slow the growth rate in the demand for electricity in California

Method: Econometric models are used to estimate electricity and gas demands for the year 2000 and to evaluate the effects of the various demand-reducing policies.

Variables: Dependent: electricity and natural gas demand

Independent: the growth slowing policies, i.e., consumer education programs, an appliance labelling program, provision of financial incentives for use of energy-saving appliances and devices, changes in the price of electricity, taxes or tax credits on more or less energy efficient electrical equipment, proscriptive policies (including building code requirements, banning the sale of certain types of equipment, restrictions on the minimum efficiency of electrical equipment or appliances and explicit rationing programs)

Findings/implications: Under certain assumptions, electricity consumption in 2000 could represent only a 65% increase over 1970 demand. This is a 72% reduction from the Conventional Utility Projection and involves the following: (1) improving insulation in new residential construction to effect a 50% reduction in heat losses/gains; (2) achieving a 50% reduction in the amount of electricity used for residential lighting; (3) achieving 50% increase in air conditioner efficiencies; (4) substituting gas for electricity in all new installations of space heating, water heating, cooking and clothes drying units; (5) accelerating construction of low-energy residential structures; (6) using solar energy for 70% of the space heating, central air conditioning and water heating requirements in residences; and (7) substituting gas for electricity in central air conditioning and refrigeration. The first three account for most of the reduction in future demand. An immediate doubling of electricity prices relative to other prices could, in the long run (10 to 20 years), reduce demand by more than 40%. Public policy makers should also consider requiring electrical utilities to introduce interruptible load service and off-peak rates for industrial customers and approximate peak-load pricing (higher rates in summer) for all customers. If necessary, utilities could be required to institute true peak-load pricing. More vigorous actions could involve restricting sales of electrical heating units, water heaters, etc.

Doering, O.C., et al.

1974. Indiana's Views on the Energy Crisis.

West Lafayette, Indiana: Purdue University Cooperative Extension Service. CES Paper No. 6.

Objective: To investigate the effects of the energy crisis on the attitudes and behaviour of Indiana residents

Method: Marginal frequency analysis was undertaken of 670 randomly selected Indiana residents responding to a questionnaire concerning public attitudes towards the 1973-74 energy crisis.

Variables: Attitudinal perceptions and behavioural patterns

Findings/implications: Although the results indicate substantial adjustments in the home and some changes in personal transportation habits due to the energy shortages, only 36% of the respondents indicated that the crisis had any "real effects" on their lifestyles.

Dole, Stephen H.

1975 Energy Use and Conservation in the Residential Sector: A Regional Analysis.
Santa Monica, Ca.: The Rand Corporation.

Objective: To evaluate various residential energy conservation policies for their effectiveness in producing energy savings

Method: Energy consumption in the residential sector was analyzed for the nine census regions for the base year 1970. Econometric analysis then projected consumption to 2000. Policy actions are postulated, and their effects on consumption estimated by the model.

Variables: Energy conservation measures and policies: (1) truth in energy or appliance labelling; (2) incentives to improve existing buildings; (3) energy standards for new buildings; (4) energy standards for new appliances; (5) energy price regulation; and (6) energy use budgets (forced reductions)

Findings/implications: The residential sector accounted for 19.6% of total U.S. energy consumption in 1970. Principal trends in use in that sector over the next 25 years include decreases in the proportion used for space heating and lighting and increases in the proportion used for refrigerators and other major appliances. The greatest potential for reducing residential sector energy use is yielded by the policies which involve new energy standards for buildings and for new appliances. Savings are projected to be 24% of residential primary energy in 2000. Among appliances, fossil fuel heating plants and refrigerator-freezers offer the greatest potential for energy savings through upgrading efficiencies. Improving the efficiency of air conditioners offers potential savings only in the west-south-central region. Potential savings from the improvement of other appliances is small but worthwhile, when taken together.

1250

Doner, W.B., Inc. and Market Opinion Research
1975 Consumer Study: Energy Crisis Attitudes and Awareness.
Detroit: W.B. Doner, Inc.

Objective: To study consumers' attitudes, beliefs and behaviour regarding the energy crisis

Method: A marginal frequency study of awareness, attitudes, behavioural changes and perceived future effects of the energy crisis based on a stratified area sample (N=525) of the state of Michigan. Data were collected between February 27, 1975 and March 10, 1975 by telephone interview.

Variables: Perceptions of and attitudes towards the energy crisis, behavioural changes due to shortages, socioeconomic impacts

Findings/implications: Half of the sample perceived that there was an energy crisis, up 9% since a similar survey one year earlier (50% in February 1975 versus 41% in February 1974). Media attention appeared to be the major reason for the increase. Three-fourths claimed to have changed their behaviour in response to the energy crisis, even though only half really believed it exists. Sixty-one % reported conservation, the principal behavioural changes being reduction in the use of gasoline, lowering home temperatures and using less electricity (mainly by reducing use of lights). One motive for conservation measures was clearly that conserving energy saves money.

Donnermeyer, Joseph F.

1977 Social Status and Attitudinal Predictors of Residential Energy Consumption.

Ph.D. dissertation, University of Kentucky.

Objectives: (1) to analyze social status, house-related factors, such as size of house, and attitudes towards the environment and energy consumption with respect to their ability to predict levels of residential energy consumption; and (2) to correlate attitude and behaviour

Method: Data were obtained from 104 respondents to the Kentucky Goals Study, a statewide survey of the opinions of Kentucky citizens on a variety of issues.

Variables: Dependent: actual consumption of natural gas

Independent: social status (years of schooling, occupation, income, property value); size of house; attitudes towards energy conservation

Findings/implications: Total family income was the best single predictor of consumption. The attitudinal items (on importance of energy conservation and priority of the energy problem) did not correlate significantly with consumption. Some of the behavioural intention items showed a moderately strong correlation with consumption.

Dueker, Kenneth J., and Irwin P. Levin

1976 Carpooling: Attitudes and Participation.

Iowa City, Iowa: The Institution of Urban and Regional Research,
The University of Iowa.

Objectives: (1) to review carpooling experience in Iowa; and (2) to describe an experimental study of attitudes toward carpooling, designed to detect important variables which explain carpool participation

Method: The experiment involved 19 female and 16 male students, who were asked to rate the relative desirability of a series of hypothetical carpools (34 in all). The approach used was an information integration approach -- its goal being to analyze how a variety of factors are combined or integrated to determine human judgements and decisions.

Variables: The hypothesized carpools varied in number and sex of riders and whether or not they were acquaintances.

Findings/implications: Earlier research indicated that attitudes towards carpooling may not reflect well the likelihood that an individual will join a carpool. There appears to be lack of sufficient incentive to overcome the difficulties of carpooling. A follow-up to an earlier study revealed that 3% of those willing to consider carpooling had actually formed a carpool, and less than one-third of those had continued carpool. The main reasons for not forming a carpool, as expressed in the earlier study, were: (1) work schedule too variable; (2) not really interested in carpooling; (3) too much waiting involved; (4) difficult to re-assemble the group after work; and (5) too much travel time. The experiment shows that the desirability of a group of riders was sensitive to the interaction between the sex of riders and acquaintance-non-acquaintance. In general, female riders were preferred to males (by both sexes), as were acquaintances to non-acquaintances. Results suggest that it is important for each rider to have at least one prior acquaintance in the carpool.

Dueker, K.J., B.D. Blair, and I.P. Levin

1977 Ride Sharing: Psychological Factors. Transport Engineering Journal, 103, TE6 (November), 685-692.

Abstract: The conventional automobile transportation system is plagued with increasing congestion, pollution, energy consumption and costs. These problems diminish the automobile's prime advantage of providing personalized, flexible transportation. Ride sharing -- through carpooling and vanpooling -- can deal directly and effectively with these problems at a minimum cost. However, ride sharing has not become widely accepted. A carpooling attitudinal survey indicates that the two most important deterrents to potential carpoolers are the extra time requirements and the loss of independence. Ongoing research involves the analysis of the commuter decision-making process with regard to their mode choice. Models of experimental psychology are being used to study the factors underlying individual preferences. These studies relate carpooling as a mode choice preference to interpersonal factors (i.e., composition of the carpool in terms of sex, prior acquaintanceship of potential riders) as important determinants of carpooling desirability.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Dun, C.F., and A.E. Kidder

1976 Factors Influencing the Success of Company-Based Carpooling Programs. University Research. Greensboro, N.C.: North Carolina Agricultural and Technical State University.

Abstract: The results of two successive interviews with selected companies in Greensboro, North Carolina are reported which undertook to review workers' interest in carpooling before, during and after the energy crisis. Companies are compared for extent of carpool formation. Companies which actively encouraged participation in carpool matching programs ended up with higher rates of carpool formation than companies which maintained a passive stance on carpooling. Carpooling appears slightly more prevalent among older workers and white-collar workers. However, the sample of companies is biased in favour of white-collar companies; therefore the relationship between occupation and carpooling remains unsettled. Corporate executives in some of the larger manufacturing concerns in Greensboro were unwilling to promote carpool matching efforts by the firm because: (1) they do not want to invade workers' privacy; (2) they felt the majority did not want to carpool; and (3) they did not wish to interfere in the workers' mode choices. Of interest is the fact that in four out of the five companies studied, the percentage of workers carpooling rose after the end of the energy crisis. New patterns of commuting by ride sharing evolved during the days of the gasoline lines and continued thereafter, spreading to other workers over time.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Duncan, Otis D

1976 Sociologists Should Reconsider Nuclear Energy.

Revised version of the first annual Amos H. Hawley lecture at the University of Michigan, Ann Arbor, November 5. Also reported in Social Forces, Vol. 57, #1 (September 1978), 1-22.

Objective: To review the past history of sociologists and nuclear energy, with reference to historical developments, in order to provide a historical perspective for sociologists to take an active role in the nuclear debate

Method: The report consists of review of work by sociologists on nuclear energy, followed by an evaluation of selective historical developments.

Variables: The performance of sociologists in research on the social aspects of nuclear power

Findings/implications: Sociologists' forecasts have generally been naive and off target. They have performed badly in matching forecasts with outcomes and in diagnosing discrepancies. An illustrative analysis of one facet of public opinion on nuclear issues -- public acceptability -- reveals a four-way interaction: (1) response to the item; (2) how controversial the item is; (3) how much confidence one has in one protagonist; and (4) how much confidence one has in the other protagonists, all in connection with an intensely argued public controversy. The author concludes that, although improved social forecasts are desirable, a higher priority should be given to reliable findings and cogent analyses of the social costs and benefits of alternative energy futures, couched in sociological theory and modern research practice.

Dunlop, David L.

1979 An Energy-Environment Simulator.

Journal of Environmental Education, 10, 4 (Summer), 43-48.

Objective: To examine the effects of an energy-environment simulator on the energy-related attitudes of its users

Method: Subjects were administered an energy opinion survey before and after using the simulator, a computer-like simulation of the energy environment. Subjects (n=129) were elementary teachers, secondary science teachers, elementary education students, and arts and sciences students.

Variables: Dependent: change in energy attitude, energy attitudes

Independent: group

Findings/implications: Virtually all (96%) agreed that an energy problem does exist. Fifty % agreed that new technology would provide solutions to the problem. Attitude change pre- and post-test was greatest for elementary teachers and weakest for the science teachers.

Durand, Richard M.

1979 A Study of Alabama Consumer Attitudes Toward the Energy Crisis.
Prepared for the Energy Impact Program, The University of Alabama

Objectives: (1) to provide a comprehensive empirical understanding of how Alabamians perceive the energy crisis and what they think should be done about it; and (2) to show them sources of information useful to them.

Method: 3,800 surveys were mailed to Alabama residents in December 1978 and January 1979; 692 were returned in usable form. A follow-up study of 73 was conducted to ascertain possible non-response bias (not significant).

Variables: Dependent: consumer behaviours: energy use (gasoline, natural gas, electricity); sensitivity to changes in energy prices; complaint behaviour; sources of information regarding energy used

Independent: demographics; perceptions of and attitudes towards the energy crisis; social psychological correlates: environmental concern, consumer alienation (powerlessness, meaninglessness, normlessness, cultural estrangement), political discontentment (dissatisfaction, disillusionment); attitudes towards utilities

Attitudes towards the energy crisis were factor analyzed against the socioeconomic, social-psychological correlates and utility belief dimensions. Dimensions of energy use were factor analyzed against the demographics, the social-psychological correlates and energy crisis perceptions. Conservation behaviours and information sources used were similarly analyzed.

Findings/implications: Attitudes towards the energy crisis Most people said that the government and industry have not done all they can to counter the crisis; 68% believed it was not contrived but real; 60% favoured burning coal (sacrificing pollution) and also believed that nuclear power was not a menace to society; 42% believed that their conserving energy would not impact total energy conservation; and 50% believed that energy companies' advertisements regarding the crisis are strictly public relations. Little of the variation in perceptions is explained by demographic variables. Somewhat more is explained by the social-psychological correlates.

Attitudes towards the utility companies 68% felt that their electric company should be forced to lower its rates; 66% believed that it was making excess profits; and 44% said that it was not facing a serious energy problem. Analysis of the correlation between utility beliefs and energy perceptions revealed that those who feel that attempts have been made to solve the energy crisis and that consumers

Durand, Richard M. (cont'd)

cannot effectively impact conservation generally have the most negative view of the utilities.

In terms of energy use, the heavy users tend to be the more affluent (higher incomes, larger homes), white and more educated. The social-psychological variables do not provide any generalizable insight into variances in usage. Likewise, perceptions of the energy crisis provide no clues. The majority of respondents (over 85%) oppose any increases in supplies; many are in favour of actions which do not affect themselves personally to any degree (84% are in favour of new building standards). As to their own actions, methods that are least expensive were preferred. Respondents seem to be relatively insensitive to any increases in energy prices; the most sensitive are the less affluent. Nearly half (45%) would not pay more taxes for energy research and pollution control. Less than 20% of the respondents have ever complained to government, the oil companies or newspapers about energy issues. Less affluent people tend to complain more directly to the utility companies. Less affluent people rely more on interpersonal sources and television for their energy-related information; more affluent people use magazines most. No relation was found between sources of information used and energy usage. In general, people feel that not enough has been done by government to solve the crisis, yet they do not want government to implement policies which affect them personally. The one variable which is significant in understanding the energy consumer is income.

It is recommended that: (1) citizens be provided with more consistent and credible information on an ongoing basis; (2) consumers be told what they can do to reduce energy usage; (3) government implement more stringent building standards and tax incentives for retrofitting; (4) an inverted rate structure and peak-load pricing be investigated; and (5) in communicating information to consumers, television, magazines and newspapers be used.

Durand, Richard, David Klemmack, and Lucinda Lee Roff.

1979 An Examination of Cohort Differences in Perceptions of the Energy Crisis.

University, Alabama: University of Alabama.

Objective: To examine the effects of age cohort on: (1) perceptions of the severity of the energy crisis; (2) beliefs regarding the adequacy of the institutional response to the energy crisis; (3) extent of personal conservation efforts; and (4) support for alternative solutions to the energy crisis

Method: 3,800 questionnaires were mailed to Alabama residents in December 1978 and January 1979; 18% were returned in usable form. A follow-up study of 73 was conducted to ascertain possible non-response bias (not significant).

Variables: Dependent: age

Independent: perceptions of the severity of the energy crisis, and the adequacy of institutional response, personal conservation efforts, attitudes towards general energy strategies and alternative solutions to the energy crisis

Findings/implications: No difference was found by age in the perception that the energy crisis was both real and severe. No statistically significant differences were found in perceptions regarding the adequacy of institutional responses, though those under 45 were less likely to perceive that corporate response had been adequate. Those over 65 indicated that they would have more difficulty in reducing consumption and believed their efforts would have little impact on total energy consumption. All indicated a willingness to try different conservation methods, though methods were all cost-free. Older people were more likely to believe that science and technology would solve the energy crisis, while the young favoured energy development over conservation as a policy solution. Older groups favoured abandoning pollution control until the energy crisis is solved.

1605

Early, John F.

1974 Effect of the Energy Crisis on Employment.
 Monthly Labor Review, 97, 8 (August), 8-16.

Objective: To determine the effects of the energy crisis on employment in the United States

Method: Marginal frequency analysis of the impact on employment of the energy shortage during November 1973 to March 1974, using data from the payroll survey of the Current Employment Statistic program, an analysis of its monthly employment estimates and labour turnover data for manufacturing, and unemployment estimates from the current population survey of households.

Variables: There are four types of effects that relate, respectively, to the inability of establishments to obtain the power needed for operation, to the reduction of goods and services output, to increased demand for alternative fuel sources and equipment needed for extraction, and to reductions in aggregate demand due to layoffs.

Findings/implications: The most obvious direct effect was gasoline service station closings and reduced hours. Other direct effects were well scattered but involved an estimated 150,000 to 225,000 jobs lost from November 1973 to March 1974. For the same period, indirect effects entailed a total employment decline of 310,000, more than half of this in the manufacture of automobile parts. Increased unemployment was heaviest among adult men, especially the 20-24 age group. The employment decline was smaller than those in major employment slowdowns and was also more concentrated in a few industries.

Eastman, Clyde, et al.

1974-75 A Socioeconomic Analysis of Environmental Concern: Case of the Four Corners Electric Power Complex.

Las Cruces: New Mexico State University Agricultural Experiment Station, Bulletin 626. Also reported in "How Much to Abate Pollution," Public Opinion Quarterly, 38 (Winter), 574-584.

Objectives: To measure the concern of affected citizens over the aesthetic environmental damage produced by the local electrical complex in terms of an economic demand of the concerned citizens for the abatement of these damages. In short, the study examines the willingness of environmental users to pay for abatement.

Method: Data were collected during the summer of 1972 and January 1973 from the Four Corners region through interviews of a sample of 760 respondents consisting of reservation residents, non-reservation residents and out-of-region recreationists. Results were based on bidding games in relation to three pictures which depicted various levels of environmental damage.

Variables: Dependent: willingness to pay abatement
Independent: bidding games (sales tax, users fee, and monthly electric bills), responsibility, socioeconomic, demographic attributes

Findings/implications: A clear majority was willing to pay for abatement except for reservation residents (52%) not willing to have the payment included in their monthly bill. However, only 18% opposed payment if it was based on a daily users' fee. In the case of non-reservation residents, 27% opposed payment through their monthly bills and 18% opposed the sales tax method. In all cases of those willing to pay for abatement, the majority favoured the under-two-dollars payment. Most also reported that they preferred the companies to pay for the abatement costs. Few consistent relationships were found between concern for environment and socioeconomic characteristics, such as age, occupation, income, ethnicity and organizational participation. Although monetary methods are generally acceptable, there is need for further research on the topics of alternative measures and non-monetary rank/order environmental concern scales.

1615

Eichenberger, Mary Ann

1975 A Comparison of Ownership of Selected Household Appliances and Residential Energy Use by Employed and Nonemployed Homemakers in the Lansing, Michigan Area.

Unpublished M.A. thesis, Michigan State University.

Objective: To assess differences in energy and appliance use by persons of different employment status.

Method: 1974 self-administered questionnaire and interview survey was conducted of families in the Lansing S.M.S.A. to assess residential energy use. Data were drawn from a random sample (N=187), and analysis of covariance was the mode of analysis.

Variables: The effects of employment status and income on direct residential energy consumption and on appliance use by function and quantity

Findings/implications: No significant differences were found among full-time, part-time and non-employed homemakers for total quantity of appliances and for major appliances owned by households. The test of a hypothesis concerning total direct residential energy revealed no significant difference among these three groups of homemakers. A non-significant finding, but one considered interesting, was that households with a fully employed homemaker used 8% less residential energy, and part-time 6% less, than households with non-employed homemakers.

Eiser, J. Richard, and Joop Van Der Pligt
1979 Beliefs and Values in the Nuclear Debate.
Journal of Applied Social Psychology, 9, 6, 524-536.

Objective: To investigate the relationship between people's attitudes towards the use of nuclear power, their specific beliefs and more general values.

Method: Questionnaires were distributed to 65 participants in a nuclear-related workshop at the University of Birmingham in May 1978. Forty-seven usable responses were obtained.

Variables: Dependent: attitudes towards a proposed nuclear development at Windscale, England; perceived consequences of nuclear industrial expansion

Independent: demographics (age)

Findings/implications: The pro group consisted of 25 respondents, the anti group 20, and two were undecided. The average age of the pros was 49, and of the antis it was 32. The two groups perceived different consequences of the development, except for its impact on unemployment. The pros saw more potential benefits and fewer adverse effects. The groups viewed different aspects of the debate as being most important and differed in their perceptions of the factors which contribute to an improvement in the "quality of life." The antis, for example, were more concerned with the environment, social welfare, public participation in decision-making and less concerned with advances in technology, higher material standards of living and industrial modernization.

Electric Power Research Institute

1977 Attitude Study Produces Mixed Blessings.
 Electrical World, 187, 1 (January) 44-47.

Abstract: The Electric Power Research Institute's electric utility rate design study of customer attitudes has found major differences of opinion on whether electricity production costs are related to time, whether customers are conserving electricity, and whether rates should be based on production costs or quantity consumed. Customers preferred voluntary reductions as a way of addressing peak demand growth and viewed controls, in general, as undesirable. Customer opinion, by customer class, regarding electricity use is profiled.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Energy Research and Development Administration

1976 Report of the Proceedings of the Energy Research and Development Administration Workshop on Consumer Motivation and Behavior Regarding Energy Conservation: Identification of R & D Opportunities. Washington, D.C.

Abstract: The workshop was comprised of three discussion groups. The purchase group discussed programs to motivate consumers to purchase more energy-efficient technologies and products. The practice group talked about ways to motivate consumers to adopt energy-efficient behaviors. The institutional group considered the institutional factors influencing an individual's purchasing decisions and energy consumption behaviours. The purchase group recommended research into consumer attitudes and behaviour by means of a large scale segmentation analysis. This would make more efficient targeting of appeals possible. It also recommended research into consumer-oriented feedback information systems and energy efficiency labels. The practice group concluded that rewards and punishments (notably personal financial incentives) were of prime importance. Information needs of the consumer were also critical, so a project providing specific information to consumers regarding the power requirements of appliances, etc. was recommended. The institutional group felt that institutions could play a two-fold role in energy conservation by devising ways to overcome existing barriers to conservation and to utilize existing opportunities to conserve energy.

Guidelines for 27 specific research projects were devised.

Energy Research and Development Administration

1976 Feasibility of an Energy Outreach Program: Final Report.
Washington, D.C.

Abstract: A conceptual approach to developing a feasible energy outreach program was adopted that involved first identifying and characterizing target markets for energy conservation information and assistance and then defining products or services to meet those markets' needs.

Ericson, Carl W.

1978 Application of Expectancy Theory of Motivation to the Energy Conservation Activities of Private Citizens.

Ph.D. dissertation, University of Tennessee.

Objective: To investigate the motivation of private citizens to conserve energy through the use of the expectancy theory of motivation

Method: 190 in-home interviews were conducted.

Variables: Dependent: behaviour

Independent: attitudes

Findings/implications: Results indicated that motivation alone could not account for performance differences but, when combined with both an effort measure and the respondents' perception of their control over their own activities, performance was significantly predicted. The public needs to be informed of the types of rewards (outcomes) of conservation behaviour. In order to induce such behaviour, the types of rewards of value to the public need to be identified. People must be aware of their ability to contribute to solving the energy crisis.

Erlbaum, Nathan, Gerald Cohen, and David Hartgen

1977 Automotive Energy Forecasts: Impact of Carpooling, Trip Chaining, and Auto Ownership.

Albany, New York: State Department of Transportation.

Abstract: This report has two objectives: (1) to calculate possible savings of gasoline consumption through a forecasting model; and (2) to recommend government policies to achieve these savings. Using data from a 1970 state-wide survey, a model of automotive fuel consumption is devised as a function of trip purposes, trip rates, number of households, trip length, auto occupancy, average vehicle efficiency and number of autos owned. Baseline fuel consumption is calculated for 1975 and 1980, and the variables are then altered to calculate possible savings. Specific policies formulated for analysis are: (1) limiting cars to less than 4000 pounds would reduce consumption by 8% from the 1975 baseline, and by 5% from the 1980 baseline; (2) a 25% increase in average auto occupancy (i.e., carpooling) would save 3.9% from the 1980 baseline; (3) introducing a community based chauffeur service would save 1.4%; and (4) and combining trips could save 10% from 1980 baseline, mainly by making shopping trips part of weekday travel and by travelling to larger shopping centres for multiple purposes. Government could encourage carpooling by paying more attention to the personal and social aspects of carpooling. Government could perform a "Transportation Audit" for households, analyzing their travelling habits and suggesting ways of reducing their gasoline consumption. Companies could use a "carpool coordinator" to match ride sharers.

1650

Executive Office of the President/Energy Policy and Planning
1978 The National Energy Plan: Summary of Public Policy.
Washington, D.C.: Executive Office of the President/Energy Policy and Planning.

Objective: To study and seek the comments and recommendations of the public towards a comprehensive national energy plan

Method: A federal register and direct mailing request for written comment from the national population in March drew 28,000 responses.

Variables: The responses to questions concerning conservation, oil imports, supply development, environment, federal regulations, intergovernmental relations, citizen participation, and hardships

Findings/implications: Generally, the majority of the respondents favoured the conservation programs that were in place and strongly supported voluntary efforts and/or tax incentives for energy conservation. Over 90% of the respondents favoured a stockpiling of energy reserves and efforts to increase domestic production while decreasing consumption. Coal was given the highest priority in resource development with solar and nuclear energy following closely behind. It was felt that the major sources of financing for these developments should come from either the government or industry. Over half of the respondents reported that environmental quality should be sacrificed for energy development. The majority favoured more federal involvement, regulation and citizen participation. The study provides a wide variety of responses indicating a number of viable options for the federal government to pursue in coping and dealing with the national energy problem.

2005

Farhar, Barbara, Patricia Weir, Charles Unseld and Barbara Burns
1979 Public Opinion About Energy: A Literature Review.
Golden, Colorado: Solar Energy Research Institute.

Objective: To draw together a fragmented body of knowledge and to interpret it so that it will become more useful and meaningful.

Method: The study reviewed and analyzed 115 surveys of the general population, of which 82 were national samples and 33 were local or regional samples. The data were collected between 1973 and 1975 and reflected a preliminary theoretical approach to public preferences and actions concerning energy.

Variables: Dependent: attitudes towards the energy crisis, energy conservation, solar energy, conventional sources, nuclear energy, environment, awareness of the energy crisis

Independent: age, sex, education, income, occupation, ethnicity, urban/rural

Findings/implications: Most people do not believe in the energy crisis, but 40% do perceive it as a serious national problem. Such matters as inflation, unemployment and crime were perceived as more serious problems. Future energy problems were perceived in terms of shortages and rising prices. The major source of blame was wasteful and unnecessary consumption. However, the oil companies and the government ranked high as causes of the problem. Belief in the energy crisis did not necessarily lead to energy conservation. The only demographic effects were that the higher the level of income and education the greater the belief in the seriousness of the energy crisis.

In the case of public perceptions towards fossil fuels, a sizeable majority did not realize that the United States imports oil. Also, a majority was opposed any sort of tax incentive or price increase as the oil companies were perceived as excessive profit takers. Rather, profit taxes and controls were favoured as a means of dealing with the oil companies.

2010

Federal Energy Administration

1976 Consumers' Attitudes, Knowledge, and Behavior Regarding Energy Conservation.

Washington, D.C.: Office of Energy Conservation and Environment.

Abstract: The study summarizes information obtained from interviews conducted by telephone from WATS facility in Princeton, New Jersey. The information on the extent to which American consumers are conserving energy and their awareness of the attitudes towards conserving energy in their daily lives will aid the Federal Energy Administration to plan and evaluate its energy conservation policies and programs. Survey questions dealt with subjects in seven chapters:

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Private Individuals' Willingness to Make Energy-Saving Efforts and their Perception of the Likelihood of Others Doing the Same;
Public Knowledge, Attitudes, and Behavior; Relating to Natural Gas Issues;
Driving and Energy Conservation;
Energy Saving Behavior Around the Home;
Parents' Perceptions of their Children's Sources of Energy Information and Energy-Related Activities;
Understanding of the Energy Situation; and
Evaluations of Alternative Actions.

Flory, John, Shibu Dhar, and Ron Knecht

1979 What Level of Electricity Service Do Californians Want?
In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use
Futures, New York: Pergamon Press (Vol. 3, 1109-1118).

Objectives: (1) to determine the costs and benefits of various levels of service for different customers in order to ascertain the appropriate level of services; and (2) to determine customers' preferences for various levels of service

Method: 1030 interviews were conducted statewide in June and July 1978 as part of a California Energy Commission survey on the attitudes, behaviour, knowledge and preferences of Californians on energy usage. The data for this paper is drawn from the load management section of that survey.

Variables: Dependent: respondents rank ordered six load management alternatives: load sharing; time of use pricing; emergency curtailment (air conditioner/water heater only); emergency curtailment (all electricity); mass media appeal; and building of more power plants. The alternatives were then rated for dollar cost, comfort, convenience, utility intervention, pollution and goodness.

Independent: demographics

Findings/implications: The mean ranking of the alternatives in order of preference was: (1) load sharing, 2.52; (2) time of use pricing, 2.61; (3) emergency curtailment (air conditioner/water heater only), 3.19; (4) emergency curtailment (all electricity, 4.53); (5) mass media appeal, 3.34; (6) building of more power plants, 4.85; and Customers who had taken part in a load management program (37 in Fresno) rated the alternatives virtually the same as the others not on load management. Few customer groups could be identified by demographic characteristics, although older people were somewhat more in favour of building more power plants and those with children under the age of five tended to prefer load sharing. Those preferring power plants appeared to be particularly adverse to the curtailment alternatives and favoured mass media appeal as a second alternative. Those opposed to power plants appeared willing to accept a reduced level of service. The mass media appeal was generally ranked as the least effective alternative.

2020

Ford, Richard H.

1977 Vanpools for Urban Transportation: Their Legislative Basis, Promotion and Potential.
Springfield, Virginia: National Technical Information Service

Abstract: This research report reflects the view that vanpooling has emerged as a viable and new form of commuter transportation that can help meet public goals of reduced fuel consumption, air pollution and congestion while affording benefits to individuals and employers. The report is meant to serve as a general assessment of current legislative interest and state promotional development in vanpooling. The information it presents should be useful to federal and state regulatory and legislative bodies; federal, state and local transportation-related agencies; university research groups; and employer organizations with or without ridesharing programs for employees.

The primary objectives of the report are as follows: to draw attention to state vanpool development and legislative action; to catalogue how the 50 states approach their regulation of vanpool operations; to present a compendium of state legislative interest, promotion and development in vanpooling in a scenario format for use by other states; to present a case study documentation of Minnesota's response to promoting and developing vanpooling as a viable commuter mode of transportation; and to offer a package list of employer, legislative and regulatory actions which should be taken to promote and encourage the development of shared-ride services like vanpooling.

Foxx, R.M., and D.F. Hake

1977 Gasoline Conservation: A Procedure for Measuring and Reducing the Driving of College Students.
Journal of Applied Behavior Analysis, 10, 1 (Spring), 61-74.

Objective: To investigate the effects of various inducements on college students' driving behaviour

Method: This attempt to motivate college students to reduce driving, and thus save gasoline, utilized students from two psychology classes at a commuter college. The students were divided into an experimental and a control group. The experimental group was offered prizes, a tour of a mental-health facility, car servicing and a university parking sticker as inducements to reduce driving. The values of prizes were scaled to match appropriate reductions in driving. Data were gathered by reading odometers and special precautions were used to detect alterations.

Variables: Prizes, driving behaviour

Findings/implications: The experimental subjects reduced their average daily mileage by 20% over the initial baseline. No change was observed in the control group. The authors conclude that some drivers can be motivated by reinforcement contingencies to reduce their driving.

Frazier, J.W. and M.E. Harvey

1977 Impact of a Continuing Energy Crisis: Changing Attitudes and Behaviors Regarding Thermostat Setback.
Presented at UMR-ONR conference on energy, Rolla, Missouri, October.

Abstract: A sample of Akron, Ohio SMSA households are utilized to examine thermostat setback as an energy-conservation strategy. Socioeconomic differences between adopting households are evaluated using discriminant analysis. The results constitute the bases on which recommendations for future increased use of the thermostat-setback strategy are made.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Freudenberg, William R.

1976 The Social Impact of Energy Boom Development of Rural Communities: A Review of Literature and Some Predictions.

Paper presented at the Annual Meeting of the American Sociological Association, New York, August.

Objective: To summarize the literature concerning the social impact of energy boom-town development

Method: Summary of the largely fugitive literature on the social impacts of energy boom-town development. Several hypotheses are proposed for future research on the nature and severity and impacts.

Variables: Size of host community, suddenness of development rate, proportion of jobs going to "locals," skill requirements of new jobs, number of new (unemployed) persons entering a region, the unemployment rate outside the region and notoriety of social disruption caused by energy development of rural communities

Findings/implications: No concrete findings are reported, but the following hypotheses guide the author's ongoing study of energy boom-town development. (1) If the size of host community is held constant, social disruption will be related directly to both the size and the suddenness of development. (2) Given a particular development, the lower the population density of the host region, the greater the disruption. (2a) The impact will be inversely proportional to the local unemployment rate. (3) The higher the proportion of jobs going to persons already living within the area, the lower the disruption. (3a) The higher the skill requirements, the greater the disruption. (4) The impact will be directly proportional to the number of new (unemployed) persons entering a region and will vary directly with (4a), the unemployment rate outside the region, and (4b), the general notoriety of the project outside the region.

The author is conducting a questionnaire study (N=800) of energy growth/potential growth towns of Colorado, with plans to employ a panel design (re-interview) at a later time. This questionnaire is the primary methodological device to be used to test the hypotheses given above.

Fulda, Michael, and Robert Bauer

1979 Energy Attitudes of West Virginia High School Students.

In R.A. Fazzolare and C.B. Smith (eds.), Changing Energy Use Futures, New York: Pergamon Press (Vol. 3, 1184-1190).

Objective: To investigate what effect experience with the Energy Environment Simulator, a computer-like device that imitates the real world, has on changing energy-related attitudes among high school students

Method: The simulator is somewhat like a time machine. Participants make decisions by controlling energy supplies and demands. The objective of the game is to maintain a supply of fossil fuels for as long as possible and to keep the environment as clean as possible. A ten-question survey was completed by approximately 1500 high school participants before and after the game.

Variables: Attitudes, perceptions, and intentions regarding the energy crisis; grade; course of study; sex

Findings/implications: Differences in the responses before and after were significant except for the second question, regarding whether the energy crisis would best be solved by energy conservation and switching to solar energy. In general, when confronted with the choice between energy shortage and environmental quality, respondents chose to sacrifice environmental quality. Students were generally ignorant of the effects of the energy crisis on their job prospects. In terms of sharing energy with the rest of the world, students were not generally willing to make large personal sacrifices. The Simulator may be able to change attitudes if they are based on faulty information, but not if they are rooted in ethics.

Fusso, Thomas E.

1978 The Polls: The Energy Crisis in Perspective.
Public Opinion Quarterly, 42, 1 (Spring), 127-136.

Objective: To present a summary of trends in public opinion regarding energy, from 1973 to 1977

Method: The results of polls conducted by the California Poll, the Gallup Poll, Louis Harris, the Minnesota Poll and the Texas Poll were examined.

Variables: Perceived seriousness of the crisis; effects of the crisis on driving habits; preferences for policies regarding gasoline use; response to Carter's energy plan

Findings/implications: About 80% of Americans thought that the crisis was very/fairly serious during 1977, compared to only about 67% during 1975. Most people agreed with the 55 mph speed limit (76% in early 1977). More people said they would find it difficult to cut their mileage by 25% in 1977 than in 1975 (65% vs. 54%). Approximately 60% of Americans are opposed to any form of gasoline rationing. They also are not in favour of increasing prices in order to lessen reliance on foreign oil supplies. Given the choice between rationing and increased gasoline taxes, neither policy emerges as a clear choice (favoured by 42% and 44% respectively). Americans generally agree that something has to be done about the crisis, but oppose specific plans which will affect them personally. Eighty-five % favour a long-range plan which sets goals for conservation, but only 15% are in favour of raising gas prices to \$1/gallon (in 1977), 43% support a tax on gas-guzzling cars and 43% prefer an oil tax which would provide funds for exploration and development.

2405

Gallup Organization, Inc.

1976 Group Discussions Regarding Consumer Energy Conservation. Washington, D.C., Federal Energy Administration.

Objective: To investigate consumers' attitudes regarding the energy situation

Method: Discussion moderators conducted eight group discussions with residents of New Jersey and Colorado. Each group consisted of from eight to ten people.

Variables: Various demographic variables, the history of energy conservation, several energy attitude and energy behaviour measures

Findings/implications: Most groups proved skeptical and cynical with respect to the energy crisis and especially with respect to the individual taking an active role in reducing energy consumption. They generally believed that alternative energy sources would be developed. Most thought that the best way to promote energy conservation was through monetary incentives. Young, middle-class adults support energy conservation in general but do not see the private sector as able or willing to make a conservation effort.

2410

Gallup Organization, Inc.

1977 Public's Behavior and Attitudes During the February 1977 Energy Crisis.

Princeton, New Jersey.

Abstract: This survey was based on interviews with a national sample (1013) of the adult population on February 4,5 and 6, 1977. The country was divided into the following areas: emergency action states (New York, New Jersey, Pennsylvania, Indiana, Ohio, Michigan, Minnesota, Virginia, West Virginia, North and South Carolina and Alabama); natural-gas-problem states (Delaware, Kentucky, Georgia, Tennessee, Mississippi, Iowa, Missouri, Wisconsin and Illinois); north; south; and west. Questions were asked about the temperature of the home, measures taken to weatherize the home, fuel use and its economic impact. The public was asked about attitudes towards government policies dealing with energy shortages; the use of coal by industries; whether fuel shortages would continue; willingness to pay more for fuels; and the comfort of the home, etc. A copy of the questionnaire is published in the report. Principal overall results are summarized first, after which responses to the individual questions are presented in tabular form.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Gallup Organization, Inc.

1977 The February 1977 Energy Crisis. Survey II
Princeton, New Jersey.

Abstract: This volume provides marginal and regional results of the second of two surveys conducted by the Gallup Organization to provide information about the general public's behaviour and attitudes at the time of the energy emergency in early 1977. The second survey, conducted on March 12, 13 and 14 by telephoning 1041 adults, was designed to obtain information about actions taken by the public to save energy -- including such things as the temperature in their home, home insulation and what had been done to save gasoline. Reactions to various possible governmental policies designed to save energy were also measured. The results are repeated for the north, south, and west sections of the United States. A copy of the questionnaire is published in the report.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

2420

Gallup Organization, Inc.

1977 The February 1977 Energy Crisis. Survey II Appendix: Significant Cross-Tabulations.

Princeton, New Jersey.

Abstract: This volume provides the significant cross-tabulation results of a survey conducted by the Gallup Organization for the Federal Energy Administration on March 12, 13, and 14 by telephoning a national sample of 1041 adults, 18 years of age and older. An 84-by-84 matrix is given that summarizes the results of the cross-tabulations. Interpretations of the results tabulated are explained. A copy of the questionnaire is published at the end of the report. The public was asked about attitudes toward government policies dealing with energy shortages; the use of coal by industries; whether fuel shortages would continue; willingness to pay more for fuels; and the comfort of the homes, etc.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Gilmore, John S.

1976 Boom Towns May Hinder Energy Resource Development.
Science, Vol. 191 (February 13), 535-540.

Objective: To study the effects and impacts of sudden industrialization and growth on energy resource development

Method: The report is based on a qualitative appraisal, based on the author's socioeconomic impact study of coal and oil shale boom towns and of the effects of rapid growth associated with energy resource development. A typology of the boom town is used to assess its functions and problems.

Variables: The socioeconomic effects of the rapid growth accompanying energy resource development

Findings/implications: The boom town is a major source of social tension in an area or a region. Both litigation and legislation result, with confrontation between state and federal governments a likely outcome. When communities are unable to furnish the services and facilities to accommodate rapid growth or to maintain the amenities of life, productivity declines, projects run overtime, and cost schedules and operating outputs fall behind.

The major implication associated with boom towns is that initial rapid growth eventually leads to deterioration unless there is careful planning. Rapid growth for these boom towns should be slowed or forestalled until the necessary facilities and processes are adapted to deal with the growth effectively. As such, growth should be carefully planned to reduce, if not remove, the negative attributes of boom towns.

2430

Goen, Richard L, and Ronald K. White

1976 Comparison of Energy Consumption Between West Germany and the United States.

Springfield, Virginia: National Technical Information Service, June. Conservation paper no. 33A, prepared for the Federal Energy Administration by the Stanford Research Institute.

Objective: To analyze the differences in per capita energy consumption between the United States and West Germany

Method: The sectors covered are transportation, industry, utilities, residential, commercial, exports and imports, and the total of all sectors. Most comparisons are for 1972, the latest year for which sufficient data were generally available. Data are presented in the form of tables.

Variables: The per capita use of energy by the United States and West Germany in the above-mentioned sectors

Findings/implications: West Germany uses only half as much energy per capita as the United States, only one-fourth as much for transportation, one-half as much for residential space heating (climate corrected) one-fourth as much for other residential uses, and 58% as much for industrial uses. The United States uses at least 40% more energy for industry in relation to output than West Germany. Total energy use in the United States in relation to national income is about 50% greater than in West Germany. The authors conclude that continued economic growth and improvement in the United States standard of living should be possible without a proportionate increase in energy consumption.

2435

Gollin, Albert E., et al.

1976 Energy Consumers' Awareness and Preferences in New Hampshire: A Comparative Assessment.

Washington, D.C.: Bureau of Social Science Research, Inc.

Objective: To determine energy consumers' awareness and preferences in order to establish the degree of comparability to the relationship between residents and energy consumption in neighbouring states

Method: A marginal frequency analysis was undertaken of a random sample of New Hampshire households (N=256) surveyed by telephone between April 30 and May 2, 1976.

Variables: Population, housing, climate conditions, appliance saturation, consumer concern and awareness, household routines and time-of-day pricing, and acceptance of time-of-day pricing.

Findings/implications: Respondents were concerned about energy, especially for home heating and electrical appliance use. They were usually aware of the main aspects of the pricing system now in use in the state, and a substantial number seemed prepared to consider significant changes in their household routines in order to take advantage of a favourable alternative pricing scheme.

Gottlieb, David

1974 Sociological Dimensions of the Energy Crisis.

Austin, Texas: The State of Texas Governor's Advisory Council.
Project E/S-5.

Objectives: To examine the attitudes and behaviour of consumers in response to the Arab oil embargo, and to assess the relationship between those attitudes and behaviour, energy knowledge and socioeconomic status

Method: Statistical analysis (frequencies, crosstabs, χ^2) was carried out of a random sample of housing units from urban (Houston, Amarillo) and rural (Colorado County, Deaf Smith County) areas of Texas to discern perceptions, attitudes, behaviour and expectations in response to the energy crisis. The pre-embargo (April-May 1974) sample is of South Texas and the post-embargo (June-July 1974) sample is of North Texas. The urban sample is based on year-round housing units from census block data tapes. The rural sample was derived from names and addresses on county tax rolls. Data were gathered from heads of household by hand-delivered questionnaires.

Variables: The effects of the energy crisis on the communities sampled with respect to three categories of socioeconomic status, an energy knowledge scale and a measure of energy consumption

Findings/implications: The only major difference found between the two regional samples was a greater concern about anticipated escalating costs of energy expressed by the post-embargo (North Texas) sample. Both samples failed to see the energy crisis as being of long-term consequence, showed distrust of energy producers and distributors and government officials connected with energy policies and programs, felt that citizens waste energy and did not blame environmentalists. Lack of knowledge about energy sources and appliance energy consumption characteristics was found to be correlated with lack of belief in the crisis. Poorer people seem to be affected most because they have the fewest alternatives. Consensus about waste was not accompanied by voluntary conservation sentiments. Respondents believed that the more real the perception of the crisis or emergency, the more responsible the populace would become, and that the shortage was more of a political contrivance than the result of the world running out of fuel.

Gottlieb, David, and Marc Matre

1975 Conceptions of Energy Shortages and Energy Conserving Behavior. Paper presented at the Annual Meeting of the American Sociological Association, San Francisco (August). Also reported in Social Science Quarterly Vol. 57, #2 (September 1976), 421-429.

Objectives: (1) to examine the attitudes and behaviour of Texas citizens in response to the circumstances existing during and shortly after the Arab oil embargo of spring 1974; and (2) to elucidate upon the relationships between the attitudes people hold about the energy situation and their efforts to conserve energy

Method: 782 randomly selected households in four geographic areas of Texas were surveyed via questionnaires administered during and shortly after the Arab oil embargo in the spring of 1974.

Variables: Dependent: belief, causes, sources of information, conservation behaviour

Independent: belief for both causes and conservation, sociodemographics

Findings/implications: A large percentage of the respondents (43%) expressed skepticism regarding the reality of the energy crisis. Only 28% strongly believed it existed. Respondents were also highly distrustful of oil and utility companies as well as the government. This was associated with the level of belief in the energy crisis. The lower the level of belief, the greater the blame of companies and the government. However, citizens perceived themselves as one of the major causes of the problem through wasteful consumption. Those of the lower socioeconomic status reported conservation efforts more often, especially in response to rising utility costs. Also, those who believed in the energy crisis reported higher levels of conservation efforts than those who did not believe in the crisis. The implications of the study are that the government and oil companies must improve their status and that the energy crisis must be further emphasized in terms of credibility. Both positive inducements will lead to increased conservation efforts by the public.

Gottlieb, David, and Marc Matre

1976 Sociological Dimensions of the Energy Crisis--A Follow-Up Study.
Houston, Texas: University of Houston Energy Institute.

Objective: To assess the extent of changes in energy conservation behaviour, attitudes and values from a year earlier

Method: Statistical analysis was conducted of a follow-up questionnaire administered from April to June 1975 on the sample described above (see Abstract number 2440).

Variables: The effects of the energy crisis on the communities sampled with respect to three categories of socioeconomic status, an energy knowledge scale and a measure of energy consumption

Findings/implications: The majority of respondents came to accept the proposition that the world is running out of fuel and that Americans are wasteful, but there was only a slight increase in belief in a serious, long-term energy crisis. No positive relationship was found between belief and energy consuming behaviour. The main motivation of those who conserved was cost. Thus, while persons of higher socioeconomic status were more likely to believe in the energy crisis, those of lower and middle socioeconomic status were more likely to reduce energy usage. As in 1974, the majority of people were not knowledgeable about energy and conservation, were only willing to endure policies which would cause the least disturbance in lifestyle and largely blamed big oil companies for the crisis.

2455

Gottlieb, David

1977 Texans' Responses to President Carter's Energy Proposals.
Paper presented at Social and Behavioral Impacts of the Energy
Crisis: A Symposium, Woodlands, Texas, June.

Objective: To assess Texans' reactions to President Carter's energy policy proposals

Method: Marginal frequency analysis was undertaken of a statewide random sample of Texas adults (N=493) drawn during the week-end of April 24- 25, 1977 following President Carter's national energy address. Appropriate comparative data are presented from two earlier surveys conducted by the Energy Institute at the University of Houston.

Variables: Respondents' opinions with regard to President Carter's energy proposals

Findings/implications: A majority (62%) heard at least one of the President's energy-related talks during the week of April 18 to 23, 1977. College graduates, older respondents and those with annual incomes in the \$10,000 to \$15,000 range more often reported hearing one of these talks.

A majority (64%) had become convinced that the nation is confronted by a long-term energy crisis (compared to 28% in the 1974 survey and 37% in the 1975 survey).

Urbanites, the more affluent, males and college graduates were more likely to endorse the notion of a long-term energy crisis in all three surveys. When asked about the cause of the crisis, 90% agreed that "the American people waste too much energy in needless consumption." A majority also believed that the world is running out of fuel supplies, that the United States has exported too much fuel overseas and that the crisis is caused by the scheming of oil companies. Only a minority perceived environmentalists as playing a major contributory role. Respondents' reactions to specific proposals by the President are detailed, including assessments of their fairness.

The proposals were regarded as unfair to Texans and the poor, and of greatest benefit to industry and the more affluent, with an even balance as to equity for consumers.

Grandjean, Burke D., and Patricia A. Taylor

1976 Public Policy and Renters' Electric Bills.

Social Science Quarterly, 57, 2 (September), 437-444.

Abstract: The objective of this study is to summarize several policy alternatives affecting "master billing." "Master billing" refers to the practice of including the cost of electrical consumption in rent, rather than having each tenant pay an individual bill. A study by the Midwest Research Institute concluded that households in master-billed dwellings use about 35% more electricity than those in comparable individually billed residences. Prohibiting new master metering would save 85 million barrels of oil (1976-1990). Converting 75% of existing master metering would cost \$900 million and would save 205 million barrels (1976-1990). It is estimated that tenants of master metered buildings currently save \$225 per year because their buildings can benefit from lower commercial utility rates. Individual billing would eliminate these "subsidies." An analysis of those currently benefiting from the subsidies indicates that the effects of eliminating master metering would be distributed more or less equally across the renter population. Governments may have to provide assistance both for those who can least afford to lose the subsidy and to cover the costs of the changeover from master to individual billing.

Grier, Eunice S.

1976 Changing Patterns of Energy Consumption and Costs in U.S. Households.

Paper presented at Allied Social Science Association Meeting, Atlantic City, September.

Objective: To examine the responses of U.S. households to increasing energy costs

Method: This study reports on the findings of two consecutive national surveys conducted by the Washington Center for Metropolitan Studies. Each was a random sample cross-section survey, the first (N=600) done in the spring of 1973 and the second (N=3200) during the spring of 1975.

Variables: The effect of increased energy costs on householders' behaviour and perceptions in conjunction with energy-related practices

Findings/implications: An energy conservation ethic is beginning to take hold among U.S. households, but efforts to conserve are as yet meagre. Although residential energy costs have risen rapidly, they remain a relatively small portion of the average U.S. household's budget. However, for certain categories of households (e.g. the poor and elderly) this rising cost is a serious and growing burden.

Grome, Mary Lynn

1979 California Residential Load Cycling Attitude Survey.

In R.A. Fazzolare and C.B. Smith (ed.s) Changing Energy Use Futures, New York: Pergamon Press (Vol. 2, 874-883).

Objective: To study customer attitudes towards residential load cycling of appliances in California, especially air conditioning

Method: Pre-test and post-test surveys were taken of attitudes and demographics of the programs of four utility service areas. The survey included only single family homes with air conditioners and was based on three types of equipment and four cycling strategies.

Variables: Dependent: participation pre-test, participation post-test, satisfaction of air conditioning, financial incentives, future participation

Independent: sex, education, income, age of home, electric utility

Findings/implications: Sample participation reflected a background of females, a home age of 7 to 12 years, an average income of \$19,000 to \$29,000 and a college education. During the pre-test stage, the main reasons for participation were intrinsic or interest satisfaction. During the post-test stage, over 90% found the program satisfactory as well as comfortable. The program of load cycling also generally helped in reducing the expenditures per household. The majority of the respondents expressed an interest in participating in future programs and slightly over half felt that all should be made to participate if that was necessary to make the program work. Financial incentives were not the main motivating factor for past or future participation; rather, it was the intrinsic satisfaction as well as rate reductions which were most appealing. The study does reveal that loadcycling is an acceptable program, but there is need for further research of the motivating factors for participation.

Hall, Timothy A.

1979 Policies and Strategies for Energy Conservation: An Assessment of Direct Regulatory Actions.

In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Futures, New York: Pergamon Press (Vol. 2, 787-796).

Abstract: The paper's objectives are: (1) to identify and discuss a systematic framework for comparing tradeoffs among different conservation policy options; and (2) to evaluate the advantages and disadvantages of direct regulatory action to require individuals and organizations to reduce energy demands. The evaluation criteria for policy alternatives include: (1) effectiveness -- achievement of substantive policy objectives; (2) efficiency -- cost, risks and benefits; (3) the distribution of costs, risks and benefits; (4) flexibility -- adaptability/applicability; and (5) "implementability" -- possibility of being approved. Mandatory conservation programs may be effective, but they may also be too inflexible to permit equitable implementation. Upgrading efficiency standards is generally recognized as having potential to reduce energy consumption; however, increased efficiency may be offset by increased usage. Federal assistance programs may be needed to help lower-income consumers purchase the higher-priced efficient products. More information and research comparing policy alternatives is required.

Hall, T.A.

1978 Work-Residence Separation: Analysis of a Commuter Carpooling
 Survey.
 Growth and Change, 9, 2 (April) 44-48.

Abstract: The Knoxville, Tennessee, employer-based carpooling program is examined to see how work-residence matching information was gathered and analyzed through questionnaires. The matching program, consisting of a master list, individual survey, and a density matrix, was funded by the Federal Highway Administration. Information was displayed graphically by syngraphic mapping (SYMAP) to identify areas of work-residence separation of participating plants and workers. Information developed in this way can be used to plan ride-sharing programs and commuter transportation in newly impacted rural areas surrounding large construction projects. Carpool data can be used to minimize relocation of the labour force as well as disruption of the communities near the site.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Hanna, Sherman

1978 Evaluation of Energy Savings Investments.
 Journal of Consumer Affairs, 12, 1 (Summer), 63-75.

Abstract: The paper discusses the need for a uniform disclosure method so that consumers can more easily evaluate energy-saving instruments. Disclosure for energy conservation is related to the use of disclosure policies in truth in lending and other areas. Five methods of evaluating energy saving investments are analyzed: apparent payback method, present value method, actual payback method, loan payment method and rate-of-return method. In terms of simplicity and understanding, the apparent payback method may be the best but, since any method should be related to a rate of return or present value method to be used validly, the rate-of-return method is probably the best choice for a uniform disclosure method. An alternative to a disclosure requirement is a product standard. The best policy for reaching energy conservation goals might be a combination of energy efficiency standards, special assistance for low-income households, uniform disclosure requirements using rates of return and a massive educational and advertising campaign to increase consumer awareness and understanding of energy alternatives.

Hannon, Bruce

1975 Energy Conservation and the Consumer.
Science, 189, 4197 (July 11, 1975), 95-102. Also reported in En-
ergy, Growth and Altruism. In Alternatives to Growth - I, Cam-
bridge, Massachusetts: Ballinger Books, 1977.

Objective: To analyze data with respect to three conservation "dilem-
mas"

Method: The three conservation dilemmas are: (1) the substitution
of energy for labour; (2) the relation between personal in-
come and energy use; and (3) the re-spending of saved dol-
lars as a function of energy use. Secondary data from the
U.S. Department of Commerce, Edison Electric Institute and
other sources for various years from 1925 to 1975 are used.

Variables: The effect of economic activities on the energy-intensity of
dollar flows

Findings/implications: (1) When wages increase relative to costs, then
energy use increases through the process of mechanization.
(2) Energy use and income are linearly connected such that
the spending of an average additional dollar of income de-
mands nearly the same amount of energy, regardless of one's
income level. (3) Saving energy usually means saving money
-- the re-spending of which reduces, if not eliminates, the
energy first thought saved. Given the interactions shown
for these three dilemmas, it is argued that there are pro-
bably no popularly acceptable solutions to energy conserva-
tion.

Hannon, Bruce

1975 Energy, Employment, and Transportation.
 Forensic Quarterly, 49, 4 (September), 497-511.

Objective: To estimate the impact of transportation systems on energy use and employment.

Method: An input-output model and U.S. data for 1963 and 1967 are used.

Variables: Dollar flow values from 362 sectors of the U.S. economy transformed into energy flow values

Findings/implications: In general, the slower the mode of transportation, the less energy intensive it is. Cars and airplanes are more energy intensive than buses, and trucks more so than trains.

Harris, Louis, and Associates

1975 A Survey of Public and Leadership Attitudes Toward Nuclear Power Development in the United States.
New York: Ebasco Services.

Objective: To measure the attitudes of the public and their leaders toward the development of nuclear energy in the United States

Method: A nationwide random sample (N=1537) of households was conducted by in-person interviews between March 21 and April 3, 1975. In addition, 301 interviews were conducted with neighbours of three nuclear power plants: 195 in San Onofre, California; 93 in Morris, Illinois; and 103 in Indian Point, New York. Finally, between March 31 and April 12, 1975, in-person interviews were conducted with 201 leaders nationwide: 51 political, 51 business, 47 regulators and 52 environmental.

Variables: Public and leadership attitudes towards nuclear power development in the United States, with reference to respondents' socioeconomic background, political interests and concerns about environmental and health issues

Findings/implications: The sample believed strongly in the prospect of a serious energy shortage that will not disappear overnight. Four in five hoped the United States would become independent of foreign energy sources. Nuclear energy was viewed by them as a viable alternative to fossil fuels as a source of electric power. The biggest drawback (registered by 63%) is the disposal of radioactive waste materials, followed by escape or radioactivity into the atmosphere (49%), chance of an explosion in the case of an accident (47%), thermal pollution (47%), the threat of sabotage (39%), polluting fumes (36%) and the possibility of theft of plutonium (34%). However, 26% regarded nuclear power plants as "very safe" and 38% as "somewhat safe," with only 13% believing they are "not so safe" and 5% believing that they are "dangerous"; 18% were undecided on this issue. Neighbours of nuclear power plants indicated that they had learned to live with them. The respondents identified some apparent advantages of nuclear energy over coal and oil and were prepared to live with the risks involved if proper safeguards and precautions were taken. Leaders, especially those in politics, seriously underestimated public concern about environmental quality and public support for building more nuclear plants. Both the public and leaders regarded scientists as more credible than any other group (e.g., government leaders, the media, environmentalists). Although the public expected government to regulate nuclear energy development, it harboured a deep distrust of government control of private industry or intrusion into the private sector as the agent of this development.

Hartgen, David

1975 Individual Travel Behavior Under Energy Constraints.
Albany, New York: State Department of Transportation.

Abstract: This report examines the state of the art regarding individuals' reported changes in travel behaviour during the energy crisis. Two studies were reviewed: one involving 300 New York residents (in three small urban cities) and another which surveyed 159 Chicago residents. Findings were as follows. (1) Eighty % of New York residents took at least one travel-related action to save energy; 50% took work-related actions, including driving slower, carpooling and walking. (2) In Chicago, the most common trip-making decisions altered were those related to nonwork trips. (3) Both studies suggest that the price elasticity of demand for gasoline is quite low, which implies that it is important to develop a nondiscriminatory and equitable rationing scheme for future energy crisis use. (4) Transit usage increased 5.9% nationwide in 1974, but the effect of the energy crisis itself is not known. (5) While many people considered buying smaller cars, there was no appreciable shift to smaller cars during the crisis or shortly thereafter; long-term trends in car sales seemed to overshadow any effects of the energy crisis.

Hartgen, David, et al.

1979 Changes in Travel in Response to the 1979 Energy Crisis.
Albany, N.Y.: State Department of Transportation.

Objectives: (1) to review aggregate trends in travel in terms of traffic, car purchase patterns, rail and air travel patterns, and recreational travel; (2) to review two studies which break down population into various segments in order to understand better their responses to conservation policies.

Method: Survey 1 (Crossley): 1,520 New York residents were surveyed by telephone in October 1979 regarding changes in their travel habits during the period from January to October, 1979; Survey 2 (Nysdot): 712 state employees in Albany were surveyed (after a car-pooling experiment) in October 1979.

Variables: Crossley: actions taken (with regard to shopping trips, driving habits, vacations, carpooling, transit use, selling car, etc.); what actions would be taken if: (a) 20% less gasoline were available, and (b) gasoline prices rose to \$1.50/gallon; demographics

Nysdot: attitudes and actions taken regarding ridesharing; general actions taken regarding the energy crisis; demographics

Findings/implications: New York experienced a sharp drop in highway travel in 1979, notably during the summer months. In June, 77 of 100 U.S. cities surveyed were experiencing an increase in transit ridership (above long-term trends). Though auto sales in general fell, importers of small cars did well, assuming nearly 24% of the U.S. auto market (a record).

The Crossley survey revealed that actions taken by consumers depend somewhat on the transportation services available in their area. New York City residents reported greater use of transit facilities, while upstate residents reported more carpooling and changing to more fuel-efficient automobiles. Energy-conserving behaviour generally declined with age and increased with family size and income. If prices increased to \$1.50/gallon or supplies were cut by 20%, some long-term actions would be taken (smaller car purchased, moved closer to job) rather than small, continuous actions. Generally, present patterns of conservation would be followed.

Hartgen, David et al. (cont'd)

The results from the Nysdot survey support those of the Crossley survey. Actions taken most often tend to be the easier and less inconvenient, such as changes in shopping behaviour, driving more slowly and keeping the car tuned. Older groups tend to perform the easier tasks. Actions increase with income until the upper levels (+\$30,000), which take substantially fewer actions. Faced with higher prices and reduced supply, younger people would do more of the difficult things, including buying a fuel-efficient car. The energy crisis will most adversely affect those people with little or no travel choices: non-urban, low-income, zero-car families. Policy makers must be cognizant of the various groups' reactions to policies.

Hass, James W., et al.

1975 Coping with the Energy Crisis: Effects of Fear Appeals Upon Attitudes Toward Energy Consumption.
 Journal of Applied Psychology, Vol. 60, 6, 754-756.

Objective: To examine the effects of the magnitude of noxiousness of a potential energy crisis and its probability of occurrence on intentions to reduce energy consumption

Method: A 2 x 2 factorial experiment was conducted in 1975 on 60 students enrolled in an undergraduate business course. The students were given two communications which dealt with two experimental manipulations: a high versus low magnitude of noxiousness of a potential energy crisis; and a high versus a low probability of that event's occurrence.

Variables: Dependent: perceptions of the likelihood of an energy crisis; perceptions of the severity of a potential crisis; perceptions of the validity/credibility of communication; behavioural intentions

 Independent: four experimental situations: (1) high magnitude of noxiousness with low probability; (2) high magnitude of noxiousness with high probability; (3) low magnitude of noxiousness with low probability; and (4) low magnitude of noxiousness with high probability

Findings/implications: Although increases in the perceived likelihood of an energy shortage had no effect, increments in the perceived noxiousness or severity of an energy crisis strengthened intentions to reduce energy consumption. The information was perceived as valid and credible, with severity producing the greatest response. This suggests that informational programs should stress the severity of the problem rather than the probability.

Hassoun, V.

1978 Electric Energy Usage In the Home: A Predictive Model.
Presented at the Conference on Major Home Appliance Technology
for Energy Conservation, Lafayette, Indiana, February.

Abstract: Families throughout the United States are facing the problems of increasing costs and decreasing supplies of readily available energy. In order to deal effectively with these problems, research-based information is needed as to what factors are major contributors to electricity usage in the home. Through the development of a predictive model, this study provides information on the contribution of selected home electric equipment and family characteristics to the demand for electricity. The data used were from a project on residential energy management in the Department of Home Economics of the Ohio Agricultural Research and Development Center. The amount of electricity used June 1975 through May 1976, by the households was the dependent variable.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Hausman, Jerry

1979 Individual Discount Rates and the Purchase and Utilization of Energy Using Durables.

Bell Journal of Economics, Vol. 10, 33-54.

Objectives: To study individual behaviour in the purchase and utilization of energy use durables, and to determine the effects of tradeoffs between capital costs for more energy-efficient appliances and operating costs

Method: (1) An econometric estimate was developed of the home market for air conditioners. Survey of 409 models of 1979 air conditioners to determine the degree of purchase price per operating cost substitution available for air conditioners. (2) A survey of 1985 households from cities across the United States in 1976 with a sub-sample of 46 homes with individual appliances metered separately.

Variables: Dependent: consumer demand

Independent: price/operating cost, durability, fuel prices, income

Findings/implications: Tradeoffs between initial purchase price and operating costs were substantial. It was found that, on a general energy efficiency ratio of 7.5% or 8.0%, the reductions in operating costs would be 6.4% with only a 3.8% increase in the initial price. As one moves from a less efficient to a more efficient unit, the percentage increase of the initial price decreases while operating costs are reduced. It was estimated that there would have to be a significant reduction in operating costs for people to purchase a more efficient air conditioner. Furthermore, if the savings are small and the interest payments are high, the net result would be increased costs. Some of the main implications of the study concern educating the public about price/cost relationships, the need for setting standards of efficiency, and the possibility of having utility companies lease air conditioning units which are energy efficient.

Hayden, A.C.S., et al.

1977 Oil Conservation in Home Heating.

Journal of Engineering and Power (July), 413-414.

Objective: To evaluate several fuel conservation strategies and establish their relative merits

Method: Five homes heated by oil in Ottawa, Canada were surveyed during the winters of 1974-75 and 1975-76. Daily records of fuel consumption and cyclic operation of the heating systems were kept. The study experimented with three strategies: thermostat setting, off-cycle losses and burner performance.

Variables: Dependent: energy consumption

Independent: outdoor temperature, house size and type, insulation, thermostat setting, off-cycle losses, burner performance

Findings/implications: The effects of insulation on energy consumption were positive in that greater reductions in consumption were attained in houses that were better insulated. A significant cutback in thermostat settings produced relatively high savings as compared to low cutbacks. Strategies associated with off-cycle losses produced moderate levels of reduced consumption while strategies for burner performance had moderately high levels of reduced consumption. All three methods proved successful in reducing consumption, with burner efficiency and thermostat settings producing the most significant results. These strategies need to be further emphasized in educating the general public.

Hayes, Steven C., and John D. Cone

1977 Reducing Residential Electrical Energy Use: Payments, Information, and Feedback.

Journal of Applied Behavior Analysis Vol. 10, 3 (Fall), 425-435.

Objectives: (1) To examine the effects of payments, information and feedback on levels of electrical energy consumption; (2) to examine the possible effects of telling subjects their consumption was being monitored and (3) to initiate preliminary parametric work on the magnitude of monetary payments necessary to effect stable reductions of electrical use

Method: Four units of an 80-unit housing complex for married students at West Virginia University were studied from late January to mid-May 1975. Because the complex was master metered it was necessary to install separate watt-hour meters. A combined multiple-baseline and withdrawal design was used to permit both within- and between-unit comparisons.

Variables: The effects of payments, information and feedback on consumption with the overall complex as a control group

Findings/implications: Payments generally produced substantial reductions of 33% on the average for all four units. In the case of information alone, reductions ranged between 9% and 30%, while feedback alone produced reductions of 15% to 21%. When feedback and payments were combined, the reduction was between 21% and 38%, whereas payments alone produced a reduction rate of 26% to 34%. As for the combination of information and payments, the reductions ranged from 26% to 43% whereas payments alone produced a range of 28% to 46%. When various payment rates were applied, the variations were small. A 33% reduction was attained for a 100% rate, 32% for a 50% rate, 27% for a 25% rate and 23% for a 10% rate. The results indicate that monetary incentives provide immediate and substantial reductions in consumption as compared with information or feedback. Feedback, on the other hand, provided promising results that may be useful as an alternative method.

Heberlein, Thomas A.

1975 Conservation Information: The Energy Crisis and Electricity Consumption in an Apartment Complex.
Energy Systems and Policy, 1, 2, 105-118.

Objective: To study the effect of conservation information on electricity use in an apartment complex

Method: A study was conducted of the effect of informational material designed to either increase or decrease the amount of electricity use in an apartment complex (N=96 apartments) near Madison, Wisconsin during March and April, 1973. In March, materials were mailed to three groups but not to a fourth, the control group. A time lapse experiment was then conducted using daily meter readings over a 30-day period.

Variables: The effects of three types of information on electricity consumption by residents of an apartment complex

Findings/implications: Neither the attempt to "engineer" a behaviour change nor the energy crisis influenced electricity consumption in these apartments. A follow-up a year later, and after the Arab oil embargo, found that no significant change in consumption had occurred.

Henderson, Floyd M., and Michael P. Voiland

1975 Some Possible Effects of Energy Shortages on Residential Preferences.

The Professional Geographer Vol. 27, 3 (August), 323-326.

Objective: To study some possible influences of the energy crisis on residential preferences in terms of regional and city location

Methods: One hundred students at the State University of New York at Albany were surveyed during the middle of December 1973 when acute shortages of gas and heating oil were developing. A modified version was applied four months later to another sample of students when the crisis had diminished.

Variables: Dependent: regional location (states and provinces); city location (suburb or city center); type of housing

Independent: time and energy crisis effects

Findings/implications: New York was both the most and least preferred place of residence. The rationale for selecting it as the most preferred concerns the high level of attachment to familiar surroundings. However, New England and New York were generally preferred least if there was an energy crisis present. The southern states were perceived as more attractive during the energy crisis, whereas Canada was preferred by a very small minority. The majority of the respondents preferred to live in the outer-city regions as well as single-family housing units. Although images and preferences were somewhat altered by the presence of the energy crisis, the sample tended to prefer familiar surroundings to which they were attached. As such, residential location would not be affected to any great degree by an energy crisis.

Hendon, Donald W.

1973 Television Viewing, Sleeping Habits, and Energy Conservation.
Columbus, Georgia: Columbus College.

Objective: To examine the effects of ending prime time television network programming at 10:00 p.m. in the Eastern and Pacific time zones (where two-thirds of the U.S. population lives) instead of the present 11:00 p.m

Method: The survey was undertaken in 1973. Samples of 77 were surveyed in Columbus, Georgia (Eastern time zone) and Auburn, Alabama (Central time zone). The two cities are served by the same television stations. Georgia Power Company supplied data used to estimate potential energy savings. Fifty people who had lived in the Central time zone but were currently living in the Eastern time zone were asked to indicate their preferences regarding the timing of network programming.

Variables: Dependent: retiring hour, energy use

Independent: time zone (time when network programming ends), television viewing habits, retiring hour

Findings/implications: "Easterners" go to bed one hour later than "Centralers" on the average, but rise at the same time. Forty-four % of Easterners indicated that television viewing was the most important or the second most important determinant of their retiring hour (Centralers -- 55%). Nineteen % of Easterners would go to bed earlier if television network programming ended earlier (5% of Centralers would do so). Asked to rank seven energy conservation measures in terms of preference, Easterners ranked ending television viewing earlier as fourth and Centralers as fifth. Using data supplied by Georgia Power regarding late night power consumption in homes, it was calculated that ending television programming one hour earlier would result in a 1.4% energy saving in the Eastern and Pacific time zones (.93% nationwide). Ninety % of those sampled who had lived in Central time zone but were now living in Eastern zone indicated a preference for 7:00 to 10:00 p.m. prime time viewing.

Cutting back the total hours of broadcast (particularly late night) may also reduce energy consumption.

Herendeen, Robert A.

1974 Affluence and Energy Demand.

Mechanical Engineering, 9, 6 (October), 18-22.

Objective: To evaluate the direct and indirect energy needs of three income classes

Method: Input-output analysis of 1960-61 Bureau of Labor Statistics Consumer Expenditure Survey data for 368 sectors of the U.S. economy (aggregated to 97) was undertaken to evaluate direct and indirect energy needs of three income classes.

Variables: The effect of income (measured by three "classes") on seven consumption categories: direct energy purchase, food and water, housing and clothing, auto purchase and maintenance, medical and education, transportation and recreation (except for auto), and investment

Findings/implications: There was an increasing importance of indirect energy impact with income. Two-thirds of energy use was indirect for the highest income classes; one-half was indirect for all consumers. The author concludes that a flat rate energy tax would be less regressive than one on only direct uses.

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Herendeen, Robert A.

1975 Appliance Energy Use. (Document Number 180)

Center for Advanced Computation, University of Illinois.

Abstract: This study looks at the relative importance of operating energy for 30 household and kitchen appliances, as well as the total energy required for three sample kitchens. The variables studied included energy use according to type of appliance and type of kitchen (from plush to spartan). Also, the costs and benefits associated with more efficient air conditioners were analyzed.

Herendeen, Robert A., and Jerry Tanaka
1976 Energy Cost of Living.
 Energy, 1, 2, 165-178.

Objective: To evaluate the energy requirements of household expenditures for all products

Method: The 1960-61 Consumer Expenditure Survey of the Bureau of Labor Statistics(N = 13,000) was analyzed using input-output analysis.

Variables: Socioeconomic variables (e.g., income, number of members, location and age of family head) as related to household energy requirements and expenditures

Findings/implications: Within error bounds, one "universal" curve shows the dependence of the energy impact of expenditures for households of two to six members. A typical poor household exerts about 65% of its energy requirements through purchases of residential energy and fuel. This fraction drops to 35% for an affluent household.

2900

Herendeen, Robert A., and Anthony Sebald

1975 Energy, Employment and Dollar Impacts of Certain Consumer Options.

In Robert H. Williams, (ed.), Ford Foundation Energy Policy Project Report: The Energy Conservation Papers, Washington, D.C.: Ford Foundation.

Objective: To examine energy conservation opportunities in switching from one transport mode to another, using input-output analysis

Method: The energy conservation opportunities in switching from one transport mode to another are examined using input-output analysis. Energy and dollar costs are calculated, along with employment impacts for both intercity and urban transport modes. Secondary data are taken from various statistical sources for the years 1963 and 1971.

Variables: Per mile values for dollars, BTUs and man-years

Findings/implications: The more labour-intensive, less energy-intensive and more economical transportation modes were rail for intercity travel and buses for urban travel. For intercity travel, the modes, in order of increasing energy intensiveness, were train, car and plane, although car and train were sometimes nearly equal. Urban bus travel cost 52% more, used 42% less energy and was twice as labour-intensive as urban car travel on a per-passenger-mile basis when total actual user costs were compared.

Herendeen, R., Hannon, B., and C. Ford

1979 An Energy Conserving Tax: How Large Should Rebates Be?
In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Fu-
tures, New York: Pergamon Press (Vol. 2, 797-804).

Objective: To describe and illustrate a method for estimating the a-
mount of the tax rebate to householders as it depends on ex-
penditure levels, number of household members and other var-
iables, for a given primary (well-head or mine-head) energy
tax.

Method: Data were obtained from the Bureau of Labor Statistics Sur-
vey of Consumer Expenditures 1972-1973, a detailed consump-
tion survey covering 19,975 U.S. households.

Variables: Dependent: energy intensity requirements of U.S. households

Independent: demographic and economic data (the focus is on
expenditure levels and number of household members)

Findings/implications: The variables which most strongly affect energy
use appear to be expenditure levels and number of household
members. Households with lower expenditure levels spend a
higher proportion of their total outlays on direct and total
energy than do those with higher expenditure levels. Tax or
rebate schemes must take this into account.

2910

Hill, D.H., and M.S. Hill,

1979 Consumer Attitudes and Perceptions And Automobile Fuel-Economy Standards.

Economic Outlook USA, 6, 2 (Spring), 39-42.

Abstract: Although domestic automobile manufacturers are forced by Title V of the 1974 Vehicle Information and Cost Savings Act to produce a fleet averaging 27.5 miles per gallon by 1985, consumer attitudes must also be changed to encourage them to buy smaller, more efficient cars rather than shifting to vehicles not covered by the law or keeping their present cars. Consumer preference research indicates that most Americans have thought about possible fuel shortages and feel there is a need to curtail consumption. The small percentage reporting a reduction in vehicle miles driven is, however, related more to the cost of fuel than to a conscious effort to save resources. Most want engine efficiency improved without sacrificing either size or performance. Recognition of the relative merits of smaller and lighter cars is viable, but sales of these cars have increased rapidly in recent years.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Hill, D.M.

1977 Marketing Approach to Carpool Demand Analysis.
Washington D.C.: Peat, Marwick, Mitchell & Co.

Abstract: From three national conferences on the effects of energy constraints on transportation systems: Schenectady, NY, USA (2 Aug. 1976). Improving auto efficiency has a high potential for transportation energy conservation. Various policies are evaluated such as: rationing policy, parking rate adjustment policy, toll surcharge policy, and carpool rebate incentive policy. These policies were applied to specific target groups at levels representative of typical programs which would be administratively feasible. The details of the policies, rationale for selection and the analytical approach are also treated. Gasoline rationing had by far the greatest impact. Parking surcharge policies were also highly effective in reducing energy consumption. Pure incentives policies, such as rebates, improved matching and reduced parking rates for carpools did not yield substantial energy savings. It is also concluded that the alternate use of a vehicle at home during the day is not significant and decreases energy savings marginally.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Hirst, Eric

1973 Transportation, Energy Use and Conservation Potential.
 Science and Public Affairs (November), 36-42.

Objective: To examine transportation, energy consumption and energy intensiveness for intercity traffic (freight and passengers) and urban passenger traffic from the perspective of the conservation potential of traffic end use

Method: Detailed econometric analysis was carried out of transportation end use patterns for 1950/70 in terms of energy intensiveness (BTUs per ton mile for freight and BTUs per passenger mile for passengers) and energy efficiency (technical efficiency -- seat miles per BTU -- and load factor -- percentage capacity used in passenger miles per seat).

Variables: Dependent: energy intensiveness, energy efficiency

 Independent: intercity/urban methods/means of transportation

Findings/implications: For the period from 1950 to 1970, there has been a shift away from less energy-intensive means of transportation to high energy-intensive means. In the case of intercity freight, air traffic has increased to .15% from .02% and trucks have increased to 19% from 13%, whereas rail has decreased from 47% to 35%. For passenger traffic, automobile use has increased from 86% to 87% for intercity and 85% to 97% for urban, whereas bus has decreased from 5% to 2% for intercity travel and 15% to 3% for urban. Intercity energy consumption increased 155%, whereas urban consumption increased 165%. Intercity traffic increased 124% while urban traffic increased 132%. Energy intensiveness increased 14% for both areas. By shifting from high to low energy-intensive modes, savings of 1.8 (BTU x 10¹⁹) can be achieved if intercity auto use is replaced by intercity bus. Savings of 4.3 (BTU x 10¹⁹) are possible if the urban auto is replaced by mass transit. Further savings can be obtained if the load factor of each mode is increased and if the technical efficiency is improved.

The implications of the study are associated with either causing modal shifts in transportation behaviour or increasing the energy efficiency of each mode. Shifts in model choice require a change in lifestyles, with the public informed of the savings that can be achieved through such changes. Also, mass transit systems must be made available and improved if changes are to be appealing. As for technical/energy efficiency, all modes require greater load factor capacity as well as reduce energy consumption per passenger mile. The available options for policy making include a wide variety of educational and informational programs and economic incentives and disincentives to bring about behaviour and efficiency changes.

Hirst, Eric

1974 Bicycles, Cars, and Energy.

Traffic Quarterly, Vol. 28 (October), 573-584.

Objective: To study the energy requirements for bicycling, including energy to produce the additional food consumed by cyclists, to manufacture and sell bicycles, to repair and maintain them and to construct bikeways.

Method: Based on 1971 data, the study develops estimates of energy requirements in terms of the cost of bicycling, added food consumption, manufacturing, selling, repairing and the construction of bikeways. These estimates are compared to similar estimates for the automobile sector to produce data to indicate the potential energy savings in terms of costs and consumption for the bicycling method.

Variables: Dependent: cost per mile, energy consumption per mile

Independent: auto, bicycle

Findings/implications: Comparisons of the costs and energy requirements for both automobiles and bicycles reveal that a bicycle costs almost one-fifth less than an automobile per passenger mile (2.57¢ per passenger mile for bicycles and 13.3¢ per passenger miles for autos) and one-twentieth less energy consumption per vehicle mile (1,340 BTUs per bicycle mile and 19,000 BTUs per auto mile). When a five-mile trip was compared for costs and consumption for both methods, the results were: energy BTU per trip was 43,000 for the bicycle and 70,000 for the auto; costs in terms of cents per trip was 23 for the bicycle and 36 for the auto; and the auto was 14 minutes faster. A 10% diversion from autos to bicycles could save about 183 billion BTUs, or 30 million barrels of oil, and \$850 million. The main problems associated with modal shifts to bicycles are safety, security and exposure. The positive advantages of cost savings, energy savings, fewer parking difficulties and health benefits need to be emphasized in promoting bicycling.

Hirst, Eric

1976 Residential Energy Conservation Strategies.
Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Objective: To evaluate the impacts of various energy conservation strategies on total energy use from 1975 to 2000 through the use of Oak Ridge National Laboratory's computer model of residential energy use.

Method: The model is first used to produce a "high" forecast of residential fuel use, close to historical trends. Changes in the variables are then postulated and evaluated (12 cases in all are run).

Variables: Dependent: energy use

Independent: household formation, housing choices, per capita income, fuel prices, improved efficiency of new equipment, increased thermal integrity of new and existing structures.

Findings/implications: Residential energy use will grow more slowly in the last quarter of this century because of slower growth in population and household formation, changes in fuel price trends and near saturation of equipment ownership for the major residential energy end uses. The highest forecast shows a growth of 3.6% per year from 1950 to 1975. Assumptions of slower growth in household formation, rising fuel prices and a continuation of 1960-75 trend in housing choices lead to a computed growth in energy use of 1.5% per year. This means, in essence, that a great deal of energy will be conserved because of projected changes in demographic conditions and increases in fuel prices. A vigorous conservation program (increased efficiency of new household equipment, improved thermal integrity of both new and existing housing units) might yield an average annual growth rate of 0.4% between 1975 and 2000. Such programs could reduce energy use in 2000 from the "business as usual" case by nearly 25% and from the "high" case by 40%.

Hirst, Eric

1978 ORNL Residential Energy Use Model.

Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Abstract: The model simulates energy use on an annual basis for four fuels, eight end uses and three housing types. Each of these fuel use components is determined within the model as a function of housing stocks and new construction, equipment installations and ownership by fuel and end use, energy efficiencies for new and existing housing units and usage factors that reflect household behaviour. These factors, in turn, are functions of fuel prices, equipment prices, incomes and technologies. Thus, the residential simulation model is sensitive to the major demographic, economic and technological determinants of residential energy use. The model has been used successfully to evaluate the energy and direct economic effects of alternative conservation strategies. Results of these analyses suggest that voluntary responses to increasing fuel prices will include purchase and use of more efficient equipment and structures. These free-market responses are likely to reduce residential energy growth substantially from its historical rate of 4% per year (1950-1972) to about 2% per year during the remainder of this century. Direct regulation of appliances and new-structure efficiencies plus programs to encourage weatherization of existing housing units are likely to cut residential energy growth by about 0.5% per year. These programs also save money for households. Energy growth can be cut even further through the development and commercialization of new technologies that provide end uses with smaller energy inputs. Although these advanced systems are likely to cost more than their conventional counterparts, the higher initial cost is more than repaid with lower fuel bills.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

2940

Hirst, Eric

1979 Effects of Energy Conservation Research, Development, and Demonstration on Residential Energy Use.
Energy Systems and Policy, Vol. 1, 37-59.

Objective: To evaluate the likely energy use and direct economic effects of developing and offering new residential energy-using technologies during the next several years

Method: Five different energy futures are evaluated with an energy model developed by Oak Ridge National Laboratory in terms of energy and economic effects. The data are based on the U.S. Department of Energy's data for 1977, from which estimates are projected for the year 2000.

Variables: Dependent: energy cost, energy consumption

Independent: scenarios (1. baseline of fuel price increases; with conservation programs; 2. new technology for structures 3. new technology for heating and cooling; 4. new technology for lighting and appliances; and 5. all of the above scenarios)

Findings/implications: In terms of energy use, each scenario decreases consumption of energy from 447.2 Q BTUs to 426.8 Q BTUs in 2000. The growth decreases as follows: (1) 1.2%; (2) 1.1%; (3) 1.0%; (4) 1.0%; and (5) 0.8%. Energy costs are also reduced for each scenario from \$603.4 billion for the first scenario to \$585.6 billion for the fifth scenario. The potential savings in terms of consumption and costs are so substantial that educational programs should be implemented to increase public awareness. Also, economic incentives should be utilized to cause public acceptance and implementation.

2945

Hirst, Eric, and Janet Carney

1977 Residential Energy Conservation: Analysis of U.S. Federal Programs.
Energy Policy (September), 211-222.

Objective: To review three residential energy conservation programs and study their effects on national energy use and on household expenditures between the present and the year 2000

Method: Econometric estimates are developed using an engineering-economic model of residential energy use developed at Oak Ridge National Laboratory. The study simulates household energy use at the national level for four fuels, eight end uses and three housing types from 1977 to 2000.

Variables: Dependent: energy consumption, costs

Independent: programs (FEA - appliance efficiency; HUD - thermal standards; retrofitting; all three; and storage), fuel prices, end uses, fuel type, per capita income, energy efficiencies, initial costs, thermal integrities

Findings/implications: Under the FEA (appliance efficiency program) refrigerators which are improved can save 33% in energy consumption while the initial cost is \$10 and savings per bill is about \$20. Thermal standards under the HUD program can yield 20%, or \$70 annually, for space heating and 16%, or \$19 annually, for air conditioning. Retrofit programs can yield a 1.4% savings or \$5 billion by 2000. The combination of all three programs provides substantial energy savings in terms of consumption and costs, while the fifth program (storage) increases the percentage of savings. These results indicate a large potential for reducing costs and consumption which should be communicated to the public and private sectors to promote energy conservation.

2950

Hirst, Eric, and Janet Carney

1978 Effects of Federal Residential Energy Conservation Programs.
Science, Vol. 199, 4331 (September 24), 845-851.

Objective: To study the effects of residential energy conservation strategies and programs on energy use and on household economics

Method: Econometric analysis, using an engineering-economic model of residential energy use, simulates household energy consumption as a result of nine scenarios which affect residential conservation. The data are based on calculations of annual fuel expenditures, equipment costs and capital costs for improvements with further reference to fuel type, end use and housing type.

Variables: Dependent: fuel expenditures, equipment costs, capital costs for improvements, consumption

Independent: fuel type, end use, housing type, scenarios (high growth, baseline price increases, energy conservation programs, and economic and conservation programs)

Findings/implications: In terms of energy use, the greater the quality and nature of the scenario program, the greater the reduction in consumption. The reverse is true for energy costs. When the program's impact and quality is increased, the costs are greater for each program. However, these increased expenditures will be compensated by reduced energy consumption and expenditures. The net result of savings and costs is about 8%, or \$25 billion, for the conservation programs. In the case of economic and conservation programs, the net costs are 3.1%, or \$63 billion. Better educational and informational programs are needed to make the public aware of these programs. Furthermore, economic incentives would make these programs more attractive.

2955

Hirst, Eric, and Jerry R. Jackson

1979 Future Energy Use in Residential and Commercial Buildings: Energy Conservation and Economics.

In Peter N. Nemetz (ed.) "Energy Policies: The Global Challenge"
Montreal: Institute for Research on Public Policy, 183-206.

Objective: To evaluate the direct energy and economic effects of adopting different conservation programs and new technology in residential and commercial buildings

Method: The study is based upon an engineering-economic model that projects estimates for 2000 concerning energy consumption. The estimates are also determined by four scenarios: (1) constant fuel prices -- high energy growth; (2) rising fuel prices; (3) National Energy Plan -- conservation and rising fuel prices; and (4) new technology -- national energy plan and new technology.

Variables: Dependent: consumption (residential and commercial)

Independent: four energy scenarios

Findings/implications: Scenario 4 projects the lowest growth from the present to the year 2000. The data results are as follows: scenario 1 -- residential growth 2.2% and commercial growth 4.9%; scenario 2 -- residential growth 1.8% and commercial growth 4.0%; scenario 3 -- residential growth 1.4% and commercial growth 3.2%; and scenario 4 -- residential growth 0.9% and commercial growth 2.9%. Future growth can vary as much as 20% about the baseline projections of energy use growth in the year 2000 (scenario 2). The study indicates that energy prices should be allowed to rise as this would be one method of causing reductions. Furthermore, the National Energy Plan and new technology produce greater savings (estimates) than either the baseline or high growth situations. This implies that the government should expand upon the National Energy Plan, with greater emphasis on conservation and new technology.

2960

Hirst, Eric, and John C. Moyers

1973 Efficiency of Energy Use in the United States.
Science, Vol. 179 (March), pp. 1299-1304. Also reported in P.H. Abelson (ed.) Energy Use, Conservation and Supply: A Special Compendium, Washington D.C.: American Association for the Advancement of Science, 1974.

Objectives: To study the efficiency of energy use in the United States and to determine the opportunities for large energy savings through improvements in transportation, space heating and air conditioning

Method: A review of energy use in 1970 in transportation, space heating and air conditioning was conducted to ascertain possibilities for conservation. Secondary data were gathered from various sources (e.g., Stanford Research Institute, Edison Electric Institute, and U.S. Bureau of the Census).

Variables: Dependent: consumption, costs, savings

Independent: transportation, space heating, air conditioning

Findings/implications: The annual growth of transportation consumption has generally been 3.2% due to shifts to energy-intensive modes. By shifting modal forms of transportation from high to low intensity, significant savings can be attained. During 1970, space heating accounted for 11% of the total energy consumed by all sectors. Improved insulation in buildings can yield a 4.6% saving for space heating consumption. Both insulation and efficiency improvements in air conditioning can yield substantial savings in consumption. The results indicate a number of policy options which could enhance conservation. Energy prices become a viable method of reducing consumption through either the high costs of the fuel or the long-term savings with efficient use. Public education is necessary to improve awareness of potential savings.

Hogan, M. Janice

1976 Energy Conservation: Family Values, Household Practices, and Contextual Variables.

Unpublished Ph.D. dissertation, Michigan State University.

Objective: To determine differences in the rate of adoption of household energy conservation practices among families with varying husband-wife patterns of congruency and commitment to values

Method: The report is based on a statistical analysis of 1974 Lansing S.M.S.A. survey (N=157).

Variables: The effect of contextual variables and measured attitudes such as self-esteem, social responsiveness, familism and ecoconsciousness on energy conservation behaviour

Findings/implications: Those conscious of environmental problems were most likely to report conserving energy. No systematic relationship was found between conservation behaviour and contextual variables -- i.e., education, occupation, employment status of wife, age, family size, income and urban-rural residence. The same lack of association was true of self-esteem and familism in relation to conservation behaviour.

2970

Hohenemser, Christopher, et al.

1977 The Distrust of Nuclear Power.

Science, 196, 4285 (April 1), 24-34.

Objective: To study public perceptions of the safety of nuclear power

Method: A qualitative study of the safety of nuclear power was undertaken, with particular emphasis on exploring how the risk of rare events enters into society's energy policy decisions.

Variables: Public perceptions of nuclear power safety as they pertain to concomitant policy decisions

Findings/implications: The issue of nuclear safety keeps cropping up no matter how many technical problems appear to be solved. This is evident from the fact that many times more money is spent per fatality on accident prevention in the nuclear industry than in fossil fuel power plants, even after the catastrophic nature of nuclear accidents is taken into account. The reasons why society tends to be overwhelmed by nuclear issues stem from the social history of nuclear power, the genuine uncertainty and complexity of safety issues, underestimation of the regulatory task and the rancorous nature of the debate. Distrust of nuclear power begins as a question about technology and turns out to be as much a question about the social institutions designed to develop, regulate and contain that technology.

2975

Holmes, Cheryl Lynn

1975 A Socio-Demographic Analysis of the Energy Intensiveness of Food Consumed with Implications for National Energy Conservation.
Unpublished M.A. thesis, Michigan State University.

Objective: To examine the relationship between food consumption and associated energy costs

Method: The study is based upon a statistical analysis of a 1974 survey of a stratified random sample (N=190) of households in the Lansing S.M.S.A. Family food consumption and socio-economic characteristics were determined via interviews. Data on fossil fuel expenditure from agriculture to super-market were obtained from a variety of sources.

Variables: The energy intensiveness of individual diets, given estimates of the energy cost per pound and per serving of specific food items. Individual diets were posited in terms of family income, occupation of the head, education and working status of the wife, and urban or rural residence.

Findings/implications: The data do not support any hypothesized differences between groups. The author infers that there is apparently no one group towards which to direct energy conservation efforts in connection with food consumption.

2980

Holmes, Cheryl L., and Peter M. Gladhart

1976 The Energy Cost of Food: The Family Can Now Make Informed Decisions.

Unpublished manuscript, Department of Family Ecology, Michigan State University.

Objective: To examine the relationship between food consumption, associated energy costs and various demographic variables

Method: Food consumption data were collected from a 1974 subsample of 190 individuals from 85 families in the Lansing S.M.S.A.

Variables: Food consumption choices, consumption time frame, energy cost of food consumed

Findings/implications: Energy intensiveness of individual diets was not found to vary with family income, occupation of the household head, wife's education and work status or residence location. Energy costs in BTUs per serving of selected representative foods are discussed.

Honnold, Julie A., and L.D. Nelson

1976 Voluntary Rationing of Scarce Resources: Some Implications of an Experimental Study.

Paper presented at the annual meeting of the American Sociological Association, New York, August.

Objective: To test commitment to conservation behaviour in relation to reward probability and magnitude

Method: A typology of conservation orientations was developed and utilized on a sample (N=485) of undergraduate students surveyed by questionnaire. Six relevant hypotheses were tested with partial correlation analysis.

Variables: Scales relating conservationism, necessity and sufficiency attitudes and perceptions to conservation orientation.

Findings/implications: Tests among the undergraduate sample supported the following predictions. Conservationists regard conservation behaviour as both necessary and adequate to attain collective benefit. Consumerists believe such behaviour to be unnecessary. Cynics view conservation behaviour as necessary but insufficient. The dissemination of scarcity information was not found to increase commitment to conservation behaviour.

Honnold, Julie A., and L.D. Nelson

1978 Public Opinion Regarding Energy Conservation.

Journal of Environment Education, 9, 4 (Summer), 20-29.

Objective: To investigate the breadth, depth and form of support for President Carter's energy proposals among a sample from the metropolitan south

Method: A telephone survey (n=426) was conducted in April and May 1977, following President Carter's energy message to Congress, April 20, 1977.

Variables: Dependent: attitude towards and knowledge of the proposals
Independent: demographics

Findings/implications: Seventy-six % of the respondents agreed with Carter's opinion about the seriousness of the world energy situation. Sixty-one % thought his proposals would be generally good for America. Those agreeing with the proposals were more educated, younger and of lower income. The majority of respondents (75%) indicated that they would not change plans to purchase a full-or medium-sized car even if a \$500 tax were levied on such purchases. The more serious respondents considered the energy problem to be, the more favourable they were towards the proposals. Their responses indicated that increases in gasoline prices would generally not have an appreciable effect on consumption.

2995

Horowitz, Abraham, and Jagdish Sheth

1977 Ridesharing to Work: A Psychological Analysis.

Washington, D.C.: 56th Annual Meeting of the Transportation Research Board.

Objectives: (1) to investigate the ridesharing attitude structure of individuals; and (2) to identify homogeneous subgroups who differ in their attitudes

Method: The survey was conducted in 1975 in Chicago. Two thousand questionnaires were distributed to employees of 34 companies: 1020 were returned, of which 822 were usable. The 822 were made up of 323 carpoolers, 382 solodriviers and 117 public transit users. Public transit users' surveys were not analyzed.

Variables: Dependent: solo-driver vs. carpooler

Independent: socioeconomic (car size, years with present employer, marital status, years at present residence, age, household size, number of licensed drivers in the household, household auto ownership, car age, sex, household annual income, occupation, education); travel (total cost, gasoline cost, travel time one-way, travel time driving alone, distance from home to work, distance to the nearest public transportation station, walk from car to work); attitudinal (evaluations of solo driving and carpooling -- high-low in terms of expens, comfort, pleasance, reliability, time consumption, convenience, safety from crime, energy consumption, traffic problems, pollution); intentions regarding joining a carpool in future

Multivariate analysis of variance (MANOVA) was performed on travel and socioeconomic characteristics. Each group was segmented into four subgroups according to a combination of two attitude factors (time-convenience and private-public cost), based on a cognitive profile. A 2x2 analysis of variance (ANOVA) was used to test the model.

Findings/implications: Significant discriminators among socioeconomic characteristics appeared to be in order of magnitude: car size, years with present employer, marital status, years at present address and age. Among travel characteristics, they were: total cost, gasoline cost, travel time one-way, travel time driving alone and distance from home to work. Discriminant analysis performed on socioeconomic and travel characteristics showed only 62% of 705 commuters were correctly classified by discriminant function (pure chance is 50%).

Horowitz, Abraham, and Jagdish Sheth (cont'd)

Driving alone was perceived by commuters to be more convenient, reliable, pleasant, comfortable and time saving. Carpooling was seen as less expensive, less energy consuming, creating fewer traffic problems and causing less pollution. Homogeneous market segments for solo drivers were identified, with significant socioeconomic differences discovered among four cells of segmentation analysis. Those solo-drivers more positive towards ridesharing than the average with respect to both factors (time and cost) tended to have higher education, income and occupation levels, were from relatively large households, and had worked and lived at the last place of employment and residence, respectively, for a shorter time than other solo-drivers.

For many solo-drivers, perceptions of economic advantages (cost) play a minor or no role in determining their behavioural disposition towards ridesharing. Campaigns to increase ridesharing should concentrate on overcoming negative perceptions of time-convenience factors (loss of time, convenience, reliability).

Hummel Carl F., et al.

1978 Perceptions of the Energy Crisis: Who is Blamed and How Do Citizens React to Environment-Lifestyle Tradeoffs?
 Environment and Behavior, 10, 1 (March), 37-88.

Objective: To assess consumers' perceptions of where blame should be placed for the energy crisis

Method: A survey was taken of two representative samples (total N=238) of residents of a Colorado community -- one when gasoline was abruptly scarce and the other after the energy problem had been established. Data were analyzed by stepwise regression.

Variables: The effect of the 1973 gasoline shortage on support for: voluntary action; mandatory actions that had benefits for energy and air pollution problems but entailed lifestyle costs; actions with energy benefits but environment costs

Findings/implications: Relatively inconsistent predictive power was obtained across five criteria (dependent variables) of explanatory variables dealing with demographics and perceived personal effects of the energy crisis. But in both samples blaming environmentalists was negatively related to support for mandatory actions that would attack air pollution as well as energy problems, and was a positive predictor for pro-energy actions that would damage the environment. Those blaming individual consumers supported mandatory remedies.

- Hutton, R. Bruce, and Dennis McNeill
1979 Research Issues, Empirical Findings, and Public Policy Implications for Energy Labelling.
In Jerry C. Olsen, (ed.), Advances in Consumer Research, Vol. VII, Proceedings of the 10th Annual Conference of the Association for Consumer Research, Ann Arbor, Michigan.

Abstract: The paper's objectives are: (1) to summarize the research issues and empirical findings concerning energy labelling; and (2) to analyze the policy implications of the research for existing and future labelling efforts. Research efforts have focused on consumer knowledge and attitudes towards energy labels, examinations of label format issues and evaluations of the impacts of labels on consumer decision-making. Studies imply that energy labels as prescribed will not change consumer choice behaviour alone. More research is needed on: motivational factors designed to influence consumers to read the labels and use the information in their decision-making process; the capacity of people to process information and the effects of an overload of information; consumers' existing knowledge and predispositions regarding product alternatives; changes in consumers' conceptual structures as a result of the availability and use of energy labels; attention to individual differences and the need for different energy labels; and evaluation of existing labelling programs and improvements in the labels now used.

Hutton, R. Bruce, Dennis L. McNeill, and William L. Wilkie

1977 . Some Issues in Designing Consumer Information Studies in Public Policy.

In H. Keith Hunt, (ed.), Advances in Consumer Research, Vol. V, Proceedings of the 8th Annual Conference of the Association for Consumer Research, Miami, Florida.

Abstract: It is crucial for researchers first to have the focus of the study clearly in mind -- if, for example, the research is concerned with policy needs, then policy objectives must be clearly understood. Two empirical studies are discussed. The first dealt with energy consumption labels and investigated the impact of the labels and the most effective format for such labels. The second study was concerned with life cycle costing and its impact as an information form on consumers. These experiments seem to provide a useful vehicle for the exploration of consumer information processing. Researchers should pay careful attention to task environment, measures and stimulus vehicle in the interests of external validity.

3015

Hyland, Stanley E., et al.

1975 The East Urbana Energy Study, 1972-1974: Instrument Development, Methodological Assessment, and Base Data.
Champaign-Urbana: University of Illinois College of Engineering.

Objective: To determine the change in behaviour and attitudes regarding energy and conservation

Method: A marginal frequency analysis was undertaken of two surveys (fall 1972, spring 1973 and a follow-up in June 1974) of a 10% stratified random sample (N=228 for first, N=116 for second) of households in East Urbana, Illinois. Data were gathered by a questionnaire administered in personal interviews.

Variables: Behavioural change over time with respect to 382 household and individual variables in the first survey and 182 in the second

Findings/implications: (Major findings have not yet been published.) People appear to have responded to the energy crisis and the concomitant rising costs by using air conditioners, vacuum cleaners and ovens less. There has been little change in automobile use -- perhaps due to the high value respondents placed on privacy, autonomy and mobility.

3605

Jacobson, James O.

1977 Employer Vanpool Programs: Factors in Their Success or Failure.
Springfield, Virginia: National Technical Information Service.

Abstract: The energy crisis of 1973-1974 convinced many Americans that changes in their commuting habits would soon be necessary. Vanpooling can not only reduce energy consumption but also save money. This study focuses only upon the employer-operated vanpool programs to identify those conditions under which vanpooling operates best. To identify factors in the success or failure of some employer vanpool programs, information was obtained from lengthy questionnaires sent to managers of 58 different employer programs.

Results show that vanpooling occurs predominantly in the outlying regions of metropolitan areas, among professional and office workers and not necessarily in organizations with many employees. Management interest played a key role and usually no previous carpool programs existed. Successful programs were motivated by factors which had some rewards to management. Failures occurred with user, more than management, apathy.

Jacoby, Jacob

1975 Ruminations of a Consumer Psychologist on the Emerging Energy Crisis.

Purdue Papers in Consumer Psychology, No. 149.

Abstract: The report examines the realities and constraints of human behaviour insofar as they constitute obstacles to resolving the energy crisis. All human behaviour is motivated. To elicit the desired behaviour concerning the energy crisis, government has to stimulate the appropriate motivation by: (1) showing the individual that he has a significant problem demanding his personal attention and making him aware of energy depletion ramifications in terms he can understand; (2) providing the individual with adequate information on which to act -- information prior to purchase and feedback devices on major energy using machines to show energy consumption during use; (3) incorporating a description of specific, concrete actionable steps to be taken by individual in response to the information presented to him; (4) facilitating and supporting changes in behaviour from environment -- government needs to be consistent and insistent in its appeal for energy conservation; (5) recognizing that there are "limits to volunteerism" -- some people will not adopt certain behaviour unless all others are forced to do so; and (6) promoting multidisciplinary research on the problem -- big business should play a role by funding research, perhaps to a greater extent than government.

Jensen, Belva Laughlin

1978 A Comparison of Two Methodologies Used With Elementary School Teachers To Develop Attitudes Toward Contemporary Energy Problems.

Unpublished Ph.D. dissertation, American University.

Objective: To determine those differences, if any, which occur as a result of applying two audio-tutorial methodologies for developing attitudes towards contemporary multidisciplinary energy problems in elementary school teachers

Method: Two workshops were held to present aspects of energy resources and conservation to elementary school teachers in southern Maryland in 1978. Attitudes of the teachers were measured, pre-test and post-test.

Variables: Dependent: attitudes on six specific energy related items
Independent: treatment (structured discussion setting with trained instructor, unstructured discussion without trained leader)

Findings/implications: In comparing the changes in both the individual and the total attitude scores, no significant differences were found between the control and the experimental group.

- Jeppesen, John C., and Mary Durkee Emshoff
1979 Assessment of Youth Conservation Attitudes and Behavior: Making
 It Worthwhile.
 In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Fu-
 tures, New York: Pergamon Press (Vol. 2, 884-891).

Abstract: The paper presents recommendations based on a Michigan Ener-
 gy Extension Service (MEES) project, the Youth Energy Sur-
 vey, which involved some 5,000 teachers and 82,000 students
 in Michigan high schools. Strategies are suggested for:
 (1) developing a useful evaluation instrument; (2) designing
 a research plan; (3) eliciting and maintaining participant
 cooperation; (4) collecting usable data; and (5) reporting
 results. The MEES project is evaluated along these dimen-
 sions. It is recommended that, in order to make conserva-
 tion education research relevant to and able to be used by
 educational practitioners, researchers should: (1) work di-
 rectly with individuals in the field; (2) plan for and act
 on feedback from multiple sources; (3) employ sound research
 methods; and (4) attend to practical considerations.

Johnson, Jean

1974 Societal and Political Implications of the Energy Crisis.
Unpublished manuscript, Forecasting International, Ltd., Arlington, Virginia.

Objective: To examine alternative lifestyles with reduced energy use

Method: Baseline secondary socioeconomic data, gathered from a variety of sources and empirical studies, are used.

Variables: The effect of alternative lifestyles (referenced to income level) with reduced emphasis on energy intensity, level of risk, environment, social cohesiveness and four dominant forces for changing energy use: political control, technological breakthrough, economic allocation and social adaptation

Findings/implications: Twenty-four scenarios are created, along with a "policy capturing" technique for inferring subject (public opinion) preferences among the scenarios.

Johnson, Warren, et al.

1977 Energy Conservation in Amish Agriculture.

Paper presented at the Annual Meeting of the American Sociological Association, Chicago, September.

Objective: To analyze energy use in Amish agriculture to determine comparative energy use and the effects on yield of the lower energy intensity of Amish agricultural methods.

Method: Energy analysis is a technique which compares different production processes in terms of energy degraded to obtain the desired product. Both Amish and non-Amish farms were sampled in central Pennsylvania, eastern Illinois and southwestern Wisconsin.

Variables: The energy ratios and agricultural yields of farms in connection with the energy value of inputs and outputs (expressed in 1000 Kilocalories or Mcal.)

Findings/implications: Although the Old Order Amish of Pennsylvania had a higher yield than their non-Amish neighbours and a net energy ratio above 1, the Amish of Illinois did not produce net energy (at 0.886) and had a yield well below nearby non-Amish farms. Despite the lack of decisive results, Amish agriculture clearly conserves energy because of the limited demands it makes on the available resources.

Johnson, C., A. Sen, and J. Galloway

1979 Tolerable Route Deviations in Van Pooling.
Transportation Research, I (February), 45-48.

Abstract: The ratio of tolerable route deviation to trip length for van pools is derived from an analysis of user cost and then compared to several operating routes. The ratio is also favourably compared to reported vanpool travel times and the often-used utility ratio. It is suggested that this ratio can be a useful planning tool for estimating the regional potential of vanpooling and for identifying specific areas of highest potential. (Thirteen references)

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

4005

Kamp, B. Dan, Crompton, John L., and David M. Hensailing

1979 The Reactions of Travelers to Gasoline Rationing and To Increases in Gasoline Prices.

Journal of Travel Research, 18, 1 (Summer), 37-41.

Objective: To gain insight into the reactions of different kinds of travellers to rationing and to substantial increases in the price of gasoline

Method: Interviews were conducted at the Texas State Welcome Center, Orange, Texas, in September 1978. A total of 92 usable responses were obtained.

Variables: Dependent: level of rationing/increase in price before traveller would be dissuaded from taking trip; alternate action in lieu of auto travel

Independent: respondent's income, number in group, characteristics of vehicle, purpose of trip

Findings/implications: In 63% of the cases, there were two people in the travelling party. Vacation was the purpose for 57% of the travellers. Only 11% were using small autos, as opposed to 19% in recreational vehicles and 27% in full-sized cars. There was a direct relationship between the fuel efficiency of the respondents' vehicles and their willingness to travel under various rationing plans (small car drivers were more willing to travel under rationing). Those who felt their trip was essential were less willing to forego their travelling in the face of rationing. More small car travellers indicated an intention to keep travelling at higher gasoline prices than did those with less fuel-efficient vehicles. Selection of alternative actions was related to the perception of the trip as essential (more likely to use alternative mode) or desirable (more likely to stay at home). Rationing would probably curtail travel more than increased prices would. The elasticity of the demand for gasoline is dependent, to some extent, on the purpose of the travel.

Kasperson, Roger, et al.

1976 Nuclear Energy, Local Conflict, and Public Opposition.
Unpublished manuscript, Department of Geography, Clark University.

Objective: To study the emergence of public concerns over the risks of nuclear power

Method: Relevant articles appearing in the New York Times and Reader's Guide between 1945 and 1975 were surveyed and categorized. Local controversy, the escalation of conflict to a higher societal level and linkages to the environmental movement are discussed in turn. Various surveys of public attitudes toward nuclear power conducted in America and abroad are reviewed. The socioeconomic correlates of public response are noted, particularly the differences between men and women. (See the Harris survey report above, Abstract number 2830).

Variables: The nature of and change in public concern since 1945 with respect to nuclear power

Findings/implications: Prior to 1955, there was little concern over the risks entailed in the operation of what were then experimental reactors. A number of accidents were reported and media interest rose between 1955 and 1961. The context of the period from 1961 to 1968 was ripe for the growth of public concern but, instead, it declined precipitously. Although public interest was low in the 1960s, local controversy increased. From these isolated clashes over individual reactors, a coordinated national campaign of nuclear opposition emerged subsequent to 1968. There is substantial evidence that environmental activists have spearheaded the opposition. The prognosis of the study is that public opposition to nuclear energy at both the local and the national level will not dissipate in the near future. Nevertheless, the authors expect the nuclear industry to continue to grow.

Keck, Carol A., et al.

1974 Changes in Individual Travel Behavior During the Energy Crisis, 1973-74.

Albany, New York: New York Department of Transportation.

Objective: To describe the results of four surveys designed to: (1) sample the attitudes of citizens regarding transit service and the energy crisis in general; (2) analyze gasoline demand by user group; (3) examine the pattern of car purchases; and (4) analyze carpooling efforts by studying automobile occupancy rates

Method: (1) surveys were conducted in three rural communities (N= approximately 300); (2) analysis was carried out using secondary data re. vehicle type and annual vehicle mileage by age and sex of owner; (3) data were tabulated from state vehicle registration files; (4) finally, two count programs in Albany supplied the data -- one conducted near the central business district and one at the campus of state offices.

Variables: (1) travel-related actions taken or considered, attitudes and responses to gasoline rationing, attitudes towards increased gasoline prices and Sunday driving bans, demographics; (2) age, sex of owner, vehicle type, annual vehicle mileage; (3) new vehicle registration; (4) size of car, number of occupants

Findings/implications: (1) Households were reluctant to alter their travel habits significantly. They were more sensitive to changes affecting them financially than to those restricting travel in other ways. A substantial majority reacted positively (i.e., by taking actions) to fuel shortages but the number of measures taken was limited. As the number of cars per family increased, more actions (and more long-term actions) were taken. (2) Demand for gasoline decreases with age and is generally greater for males. Gasoline rationing would most severely restrict auto usage for those in their principal earning years, 21 to 50. (3) There were few changes in new vehicle registration (vs. the previous year) until December 1973, when total registrations fell. There was no shift to compact cars, but some shift from standard to intermediate-sized autos. (4) From December 1973 to May 1974 there was no change in average occupancy rates in the central business district. The occupancy rate for state employees was higher than that for the general population.

Kendall, K.W.

1978 Consumer Behavior and Energy Conservation.

Position paper prepared for the Consumer Research Branch, Consumer and Corporate Affairs Canada.

Abstract: The paper: (1) reviews available literature regarding consumers' attitudes, values, beliefs and behaviour towards the use and conservation of energy, focusing on two key areas: major influences on energy usage and conservation, and communication and information techniques; and (2) delineates a structure for studying the problem and suggests topics for research. Studies which examined consumer reactions to the energy problem are reviewed. Based on data gathered from 1973 to 1977 in the United States, it appears that any declines in energy use were not because of conservation efforts but because of price increases. Middle-income, middle-educated families with children reported the most changes in energy use activities. Many consumers do not know how to conserve energy. In general, the state of the art in understanding consumer attitudes and motivation through survey analysis is poor. In terms of public policy interventions, goal orientation appears to have the best results in modifying behaviour. Incentive studies reveal that cash rebates are most effective. Behaviour modification is not regarded as a viable technique to change mass consumption habits. Instead, mass communications may be a more convenient method. Neutral sources (not government or industry) may be more effective in causing an awareness of the issues. A more coordinated, step by step procedure is required to tell consumers how to conserve energy. Studies suggest that energy usage is not now an important factor in purchasing decisions.

Research proposals are made in four areas: current patterns of consumption; mass media information campaigns; dissemination of information to consumers in forms other than the mass media; and the point-of-purchase area of consumer decision-making.

The instruments used in two energy consumption studies conducted at Dalhousie University are presented.

Keyfitz, Nathan

1976 World Resources and the World Middle Class.
Scientific American, 235, 1 (July), 28-35.

Objective: To study the feasibility of entry by the less developed countries into the resource intensive world "middle-class"

Method: UN figures are the points of departure.

Variables: Economic development for less developed countries as a function of world population growth in relation to dwindling world resources

Findings/implications: Constraints on both production and environmental quality will limit the growth of the world middle class.

Kilkeary, Rovena

1975 The Energy Crisis and Decision-Making in the Family.
Springfield, Virginia: National Technical Information Service,
January. NTIS Report No. NSF-SOS GY-11543.

Objective: To determine whether family characteristics and energy related experiences affect household energy knowledge and conservation practices

Method: A statistical analysis was carried out of a random sample (N=602) of Bronx and Queens, New York households. Data were collected by interview during July and August, 1974.

Variables: The effect of the energy crisis on household member characteristics, energy knowledge and actual practices in terms of exposure to extended blackouts, direct payment of utility bills, car ownership, belief that families in the United States pulling together can influence the energy crisis, family income, educational attainment, family composition, age, sex and recent major appliance purchases

Findings/implications: Car ownership, education and family composition (number, ages and sex) were positively related to energy knowledge scores. Exposure to extended blackouts, direct payment of utility bills, car ownership, the belief that, together, U.S. families can affect the energy crisis and family composition were positively related to changed practice scores (i.e., a measure of the practice of energy savings). The strongest influence on knowledge and conservation was income, with middle-income households having the highest scores. Families composed of couples with children also demonstrated high levels of energy knowledge and conservation practices. The strongest influence on energy use was the pocketbook. Families that could afford to pay energy price rises did, while moderate-income families tended to strive to save energy.

King, Jill A.

1975 The Impact of Energy Price Increases on Low Income Families.
Washington, D.C.: U.S. Federal Agency Administration, Office of
Economic Impact.

Objective: To analyze the impact of energy price increases on low-income families

Method: An energy data file for a nationally representative sample of 50,000 households in the continental United States was used. Energy expenditures for each of six energy types -- electricity, piped natural gas, bottled gas, fuel oil, coal and gasoline -- were inputted for each household, depending on its usage, from this data file. The primary data source was the Public Use Sample of the 1970 Census of Population, supplemented by travel information from the Nationwide Personal Transportation Study. Energy expenditures in 1974 were estimated using figures from a microsimulation which related energy consumption and disposable income for 1973 data.

Variables: The effect on low-income families of increasing energy expenditures for electricity, piped natural gas, bottled gas, fuel oil, coal and gasoline

Findings/implications: A substantial rise in expenditures for energy in the home occurred as a result of 1973-74 energy price increases. Households in New England and the middle Atlantic regions were hardest hit. Although low-income households spent less on energy and experienced smaller absolute increases in expenditures, these expenditures and increases represented a much larger proportion of their disposable income than for high-income households by a factor of ten. Single-family homes, larger families and rural locations were associated with larger impact because families with these characteristics use more energy. The impact of higher energy prices for home fuel expenditures did not vary by household characteristics, (e.g., race, age or occupation of head of household). Gasoline expenditures and their impact did not exhibit as wide a regional variation.

Klausner, Samuel Z.

1977 Energy Shortages and the Poor.

Paper presented at Social and Behavioral Implications of the Energy Crisis: A Symposium, Woodlands, Texas, June.

Objective: Energy consumption is analyzed in relationship to social structure

Method: A sample of households (the unit of analysis) was selected from a list of those on the Aid to Families with Dependent Children Program in Camden, New Jersey for June and July of 1969, 1970 and 1973. Respectively, 438,373 and 291 heads of welfare households were interviewed. Respondents were asked for income and expenditure budgets, including purchases of energy lumped into a single figure, for the month prior to the interview. Information was also gathered on demographic, psychological and household interaction attributes.

Variables: The effects of household social organization on energy consumption

Findings/implications: Three conditions are predisposed to increased household energy consumption: (1) a base of familial relations supporting interaction focused around the home; (2) a tendency towards a high tempo of social activity; and (3) a tendency on the part of the head of household towards expressiveness, spontaneity, personal relations and relaxed discipline. The presence of a male (or male disposition) increased order and decreased energy consumption. The author concludes that this refutes the macrosocial proposition which regards increasing social complexity as causing increased energy consumption.

Knoxville Commuter Pool

1978 Knoxville Commuter Pool: Annual Report, 1977-1978.

Springfield, Virginia: National Technical Information Services.

Abstract: The Brokerage Bureau, commonly known as the Knoxville Commuter Pool (KCP), came into being on October 23, 1975 through a formal agreement between the Urban Mass Transportation Administration (UMTA) and the City of Knoxville. Currently, the KCP is a part of the city government; however, its services actually extend over a region comparable to the East Tennessee Development District. KCP has integrated vanpools into the general ride-sharing system which includes carpools, transit buses and privately operated express buses. One of the most significant accomplishments of the KCP was the establishment of credibility and awareness among the local business community and the general public concerning ride-sharing.

This annual report presents a concise description of the background, objectives, organization and accomplishments of the Knoxville Transportation Brokerage Project. Special attention is given to details of employer/employee participation, concentrated program efforts in the Central Business District and a telephone information and brokerage service. The vanpool program is described in detail, including maintenance, the transition of the vans to private ownership and the formation of an association of private vanpool owner/operators. Other aspects of the project covered include the development of computer matching capacity, social service brokerage, a downtown fare-free bus zone and promotion and advertising. Related reports of the project entitled The Knoxville Transportation Brokerage Project are: Volume I, Philosophy and Institutional Issues (PB 292-592); Volume II, Operations and Management (PB 282-248); Volume III, An Eighteen-Month Evaluation (PB 292-593); and Interim Report (PB 270-103).

Kocur, G., Zselke, D., and L. Neumann

1977 Feasibility Study of Shared Ride Auto Transit.

Springfield, Virginia: National Technical Information Service.

Abstract: This report assesses the feasibility of implementing shared-ride auto transit (SRAT), an innovative approach for increasing auto occupancy in rural and urban areas. The report focuses on operational concepts, potential usage, legal and regulatory issues, and institutional issues. Formulation of the SRAT concept was motivated by several concerns, such as: (1) energy conservation; (2) transit service extension to areas unable to justify conventional transit services economically and to travel disadvantaged groups; (3) transit service replacement to achieve greater efficiency and to reduce transit deficits; (4) provision of inexpensive transit service to users; and (5) increased safety and reliability of hitchhiking.

Four case study sites (Boulder, Colorado; Boston, Massachusetts; Portland, Oregon; and Tidewater, Virginia), were used to identify the specific institutional issues likely to impact SRAT implementation for that site and the opportunities for designing, implementing and operating SRAT in a variety of institutional settings. The factors which might facilitate or impede SRAT implementation vary from site to site. However, a number of the same concerns may arise in each of the settings.

The report also includes Appendix A, which lists existing and proposed SRAT systems, and Appendix B, which shows the derivations of equations used in the SRAT route and stop analysis.

The study finds that SRAT can provide sufficiently high service levels. However, personal security, reliability and social acceptance will have to be met. A number of potentially serious institutional barriers to SRAT exist but, by designing the system to reflect a site's particular institutional setting, these barriers may often be overcome.

Kohlenberg, Rober, et al.

1976 A Behavioral Analysis of Peaking in Residential Electrical-Energy Consumers.

Journal of Applied Behavior Analysis, 9, 1 (Spring), 13-18.

Objective: To investigate the peaking tendency in residential electricity usage and the effects on peaking of information, feedback and incentives

Method: "Peaking" -- the tendency for electrical energy users to consume at high rates for brief periods during the day -- was examined through a continuous data collection system for monitoring consumption of electrical energy in the homes of three volunteer families. The experiment was conducted over a three month period from early January through March in the Seattle area on three middle-class families. Data were automatically recorded and data records were not visible to the subjects. Three baselines and conditions were administered to each family.

Variables: The effects of information, feedback and incentives on the peaking behaviour of middle-class families

Findings/implications: A combination of feedback plus incentives proved to be most effective, reducing peaking by about 50%. When experimental treatments were removed, subjects returned to pre-treatment patterns of consumption.

Kostyniuk, Lidia P., and Wilfred Recker

1976 Effect of a Gasoline Shortage on Acceptability of Modes for the Urban Grocery Shopping Trip.
Journal of Environmental Systems, 6, 9, 1-30.

Objective: To study the differences in perceived acceptabilities, in relation to the gasoline shortage, of modes for the urban grocery shopping trip

Method: Data were gathered using a psychological continuum scale, from a survey mailed to a random sample of 1500 households in six representative subareas of Buffalo, New York from December 1973 to March 1974.

Variables: The effect of the gasoline shortage on the travel mode to and from and the place of shopping, opinions on mode choice and socioeconomic description of the households

Findings/implications: There was a general increase in the acceptability of walking in the middle of the scale and a decrease in the acceptability of the driver mode across the subsamples. Taxi, bus and bicycle were rated near the bottom end of the scale for all subsamples. An increase in the acceptability of the bus was most pronounced among the lower-income subsamples, but this was not sufficient to take this mode into the acceptable category.

Kouris, George J.

1978 Price Sensitivity of Petrol Consumption and Some Policy Implications.

Energy Policy, 6, 3 (September), 209-216.

Objectives: (1) to estimate the price elasticity of petrol in the context of a demand model; (2) to assess the impact of tax increments on petrol consumption; and (3) to draw up tentative policy implications.

Method: The model is applied to each EEC country for the period 1956 to 1973. As well, the cross-sectional and time series data are pooled and analyzed.

Variables: Dependent: petrol demand

Independent: real disposable income, real price of petrol

Findings/implications: The results obtained from the analysis of individual countries were generally poor. Better estimates were yielded by the pooled data. Estimates for the short-run income and price elasticities for petrol were 0.53 and -0.23, respectively. The implied long-term elasticities (after taking into account the lagged term) were 1.73 for income and -0.75 for price. The predictive power of the model is tested by comparing forecasts for 1974 to 1976 with actual values. The forecast for 1974 was very close to the actual value but forecasts for 1975 and 1976 were off. The poor estimates obtained for 1975 and 1976 imply that the model does not capture some essential determinants of petrol demand. The explanation provided is that the demand for autos (and thus petrol) is becoming more of a necessity good, making the demand for petrol less price and income elastic. The 1974 forecast coincided with the actual value only because of the peculiar events of 1974. Any tax imposed on petrol with the intent to curb its use would not decrease consumption significantly. Such a tax would provide the government with increased revenue. Energy-conservation efforts would be best directed towards the design of more efficient automobiles.

Kruvant, William J.

1975 People, Energy, and Pollution.

In Dorothy K. Newman and Dawn Day Wachtel, (ed.s), Ford Foundation Energy Policy Project Report: The American Energy Consumer, Washington, D.C.: Ford Foundation.

Objective: To discover the most likely victims of pollution

Method: The report examines pollution estimates for the major part of five metropolitan areas and looks at the relationship between air pollution and the socioeconomic characteristics of people in the Washington, D.C. metropolitan area. 1968-70 secondary data were mostly from the U.S. Bureau of Census reports and pollution data were from the District of Columbia Department of Environmental Services, data from both sources having been prepared by the Washington Center for Metropolitan Studies.

Variables: The relative income-level effect of pollution on subareas of Washington, D.C..

Findings/implications: The Washington data show that socioeconomic characteristics associated with disadvantage -- poverty, occupations below management and professional levels, low rent and high concentrations of black residents -- go hand in hand with poor air quality. These groups produce little of the air pollution which affects them. The findings show that antipollution policies have already helped disadvantaged groups, proving that well-enforced policies can be effective.

Kurish, James B., and Eric Hirst

1979 A Regional Analysis of Residential Energy Conservation Programs.
Journal of Environmental Systems, 9, 1, 67-87.

Objective: To evaluate the energy and economic effects in each of the ten federal regions of implementing the residential energy conservation programs of the National Energy Plan (NEP)

Method: Five simulated energy "futures" are evaluated: (1) base-line, no government conservation programs; (2) an appliance efficiency program; (3) new construction standards; (4) a retrofit program; and (5) a combination of the second and fourth scenarios.

Variables: Dependent: effects on regional residential energy use and on household economics (fuel bills, capital costs for equipment and structures)

Independent: population, fuel prices, per capita income, government conservation program(s)

Findings/implications: Each of the residential conservation programs in the NEP is likely to reduce energy growth in each of the ten regions, but there is some variance in that reduction. It is difficult to pinpoint those factors which account for the variation, but it appears that fuel prices and climate are important. Although national benefits (\$21 billion to the nation's households) will result from the implementation of the conservation programs, care must be taken that some regions do not suffer economically, as the benefits will not be distributed evenly.

Kushler, Martin

1979 Energy Education and High School Teachers: Research Findings of the Michigan Youth Energy Education Project.
Lansing, Michigan: Michigan Energy Administration.

Objective: This report describes a study of Michigan high school teachers that tried to isolate methods of influencing teachers to teach energy conservation in their classes. Phase I of the project had indicated that positive changes in students' energy attitudes and actions were generated by teachers' holding classes on energy conservation (see Stevens et al.).

Method: 305 teachers in 95 Michigan high schools were surveyed at the end of the semester, having undergone one of five treatments (teacher consultation, energy committee consultation, teacher training workshop, teacher workshop including "task-oriented" training, or the no treatment control group).

Variables: Dependent: teacher response (teaching about energy conservation), student attitudes, student self-reported energy conservation behaviour.

Independent: sex of teacher, subject taught, number of students in class, treatment received or not, number of other teachers whom teacher knows at his/her school who are interested in teaching about energy conservation, teacher's rating of the scholastic ability of the class, teacher's self-rating of knowledge of energy conservation, teacher's rating of the need for energy conservation, teacher's rating of how free teachers are to design their own curriculum (both in general and themselves personally).

One-way analysis of variance with five levels of treatment was performed.

Findings/implications: The following variables were found to be statistically significant (in order of magnitude): whether the teacher received treatment; the subject taught (although positive results were found regardless of subject taught); teacher's self-rating of knowledge of energy conservation issues; teacher's rating of the importance of energy conservation; and the number of teachers interested in energy conservation at the teacher's school. Seventy-five % of the teachers receiving treatment taught classes on energy conservation vs. 40% of the control group. Those receiving treatment taught an average of twice as many class sessions on energy conservation as those in control group. It is possible to influence teachers to teach energy conservation techniques, thereby improving attitudes and actions regarding energy conservation through the educational system.

Kwast, M.L.

1977 Household Energy Demand: An Investigation Into The Welfare Economics of Energy Prices and Policy.
Madison, Wisconsin: University of Wisconsin.

Abstract: This thesis develops an analytical and empirical framework for examining the impact of an individual household of alternative pricing policies designed to achieve a given degree of energy conservation in the household sector. A primary motivation for this effort is that policymakers must be able to determine the least-cost means of achieving their goals. Household energy demand is defined as a residential consuming unit's demand for electricity, natural gas and fuel oil. The impact of policy is measured by the net change in consumer's surplus caused by the pricing policy. Short- and long-run demand functions for each of the three fuels are derived by assuming that the household maximizes the utility derived from a flow of services acquired by combining its purchases of fuels with its stock of energy-using capital. The fuels and capital used to produce these services are assumed to compose a separable commodity group in the household's utility function. The household's problem thus becomes one of optimal control, the solutions to which are the relevant demand functions. The fact that electricity and natural gas are prices in "declining rate blocks" complicates the measurement of the net change in consumer's surplus. Essentially, the price of each fuel becomes an endogenous variable at the household level. Also, a change in the price of one is likely to induce a change in the price of the other. Appropriate expressions for measuring the net change in consumer's surplus in a multiple-price change world are derived. Short-run and long-run demand equations for each of the three fuels, and rate schedule equations for electricity and natural gas are estimated.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Lave, Charles A.

1979 Energy Policy as Public Policy.

In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Futures, New York: Pergamon Press (Vol. 4, 2046-2053).

Abstract: The paper outlines three policy alternatives which will do much more in terms of energy conservation than two currently being followed, the 55 mph speed limit and attempts to increase use of public transit. The 55 mph speed limit reduced gasoline consumption by only 1 to 2%, considerable resources are required to enforce it and it has caused much public antagonism. Similarly, the potential gains of encouraging more people to use public transit are not large. The three alternative policies suggested are: (1) subsidized tuneups for automobiles; (2) permitting fuel-efficient cars to travel at higher speeds on highways (65 mph vs. 55 mph) -- computing the costs and benefits of the 55 mph speed limit in terms of wasted time vs. saved lives, it is concluded that the cost/benefit ratio is only 0.15; and (3) giving away fuel-efficient cars to commuters. The third policy alternative would involve limiting the size of vehicles permitted on freeways during rush hours, adding lanes to the freeways (possible with smaller cars) and then giving away mini-cars to commuters. This would generate savings when compared to the cost of developing a rail transit commuter system.

4410

Leholm, Arlen, et al.

1975 Profile of North Dakota's Coal Mine and Electric Power Plant Operating Work Force.

Fargo, North Dakota: North Dakota State Department of Agricultural Economics, Report No. 100.

Objective: To determine the socioeconomic characteristics of the operating work forces in North Dakota mines and power plants

Method: Marginal frequency analysis was undertaken of a questionnaire mailed or handed out to all (N=416) employees of the four largest coal mines and four largest electric power plants in North Dakota during June 1974.

Variables: Years lived in present community, years worked for the given company, rates of pay, job satisfaction, commuting distance, education, in-migration from out of state to work at the plants or mines

Findings/implications: The work force proved to be very stable, having lived an average of 22 years in their present community and worked an average of 8.6 years with their present employer. The coal industry workers had higher average annual incomes than the coal workers' average in the state as a whole (median incomes averaged between \$12,000 to \$13,000 per annum), despite their low levels of formal education (72% of employees had 12 years or less of education). More than half of the work force resided within the county before they were hired. Workers reported generally high satisfaction with their jobs. Length of employment is negatively associated with in-migration from another state.

4415

Levy, Paul F.

1973 The Residential Demand for Electricity in New England.
Cambridge, Massachusetts: Massachusetts Institute of Technology.
Report No. MIT-EL-73-017.

Objective: To examine residential demand for electricity in New England and its determinants

Method: An econometric model was developed based on 1970 cross-section data for 67 New England electric utilities and their service areas. A two-stage least squares design was used to obtain consistent coefficients in terms of estimated supply price and demand equations. Elasticities of demand were also calculated. Data are from the utilities and a number of statistical reports.

Variables: The effect of price on residential electricity demand in conjunction with various socioeconomic characteristics

Findings/implications: Residential demand for electricity was found to be significantly correlated with its average price, family income, family size, heating degree days and the ownership (private or public) of the electric utility. Price and income were the most important determinants. The supply price is correlated with the quantity of electricity consumed, utility operation and maintenance costs, total number of customers, degree of urbanization and the ownership of the utility. A significant elasticity of demand with respect to price as well as income was established.

Little, Ronald L.

1976 Rural Industrialization: The Four Corners Regions.
In Lewis Carter and Louis Gray (ed.s), Social Implications of Energy Scarcity: Social and Technological Priorities in Steady State and Constricting Systems, Washington, D.C.: National Science Foundation.

Objective: To examine the attitudes of residents of the Four Corners region towards energy development projects

Method: The study team utilized a random sample survey of 407 residents of five communities (Blanding, Monticello, Kanab and Escalante, Utah; and Page, Arizona) in the Four Corners area of the southwest during the summer of 1974. Each of the five communities was in the proximity of and/or had experienced "energy resource development." Over 92% of all sampled respondents furnished completed interviews and the interview schedules were largely composed of open-ended questions. All persons interviewed were household heads. Marginal frequency analysis of the survey results is combined with presentation of relevant U.S. census data.

Variables: Attitudes towards energy development in the Four Corners region

Findings/implications: Over 80% of the respondents were favourably disposed toward "extant energy developments" (e.g., the Four Corners Power Plant, Glen Canyon Dam, Black Mesa Coal Mine) and the proposed "Kaiparowits Project" (a coal strip-mining venture). Two major reasons were given by respondents for favouring extant and proposed energy development projects: (1) society's need for energy; and (2) the expected employment and economic benefits of energy development projects for the region. Expected environmental damage and the belief that there was no overwhelming need for more energy were the two major reasons for disapproving of energy development projects. The author speculates that the strong support of energy resource development can be attributed to the prevailing economic and religious patterns in the communities. For example, Mormon religious beliefs are dominant in the region and the author suggests that "Mormon doctrine and practice provide both stimulus and justification for engaging in economic activities" and "stresses the active development of resources." (See also Lovejoy, 1976, Abstract number 4450).

Little, Ronald L.

1976 Some Social Consequences of Boom Towns.

Unpublished manuscript, Department of Sociology, Utah State University.

Objective: To summarize the research on boom towns and to analyze in particular the experience of Page, Arizona

Method: The analysis of Page employs both census-type data and the survey gathered in connection with the Little and Lovejoy paper (see Abstract number 4430).

Variables: The social consequences of boom and bust cycles of community development

Findings/implications: The primary result of boom town development is rapid population growth, which typically leads to a breakdown in municipal services and other institutional facets of the community. Because population growth is the major initial element of the boom town phenomenon, boom towns are seldom manifest in urban areas (since a new industry that adds 10,000 or 20,000 persons will be only a negligible proportion of the population of a large city). Energy resource development in the western states appears destined to foster boom town problems in a number of small rural communities. These problems are apparent in the case study of Page (increased crime rate and high community conflict).

While the obvious solution to boom town problems is to slow down and stretch out the construction process, industries find this solution unacceptable because construction compressed into a short time period is most economical. The present national mania over energy self-sufficiency would, in the opinion of the author, also conflict with the solution of stretching out the construction process. The author also argues that the boom town consequences of energy and other natural resource developments are seldom considered in the making of political decisions and the environmental impact statement process only exacerbates these problems. Boom town phenomena are complex and Energy Inspection Services are structured so as to direct attention away from questions that need to be answered and towards questions that can be answered quickly and with little research effort.

Little, Ronald L, and Stephen B. Lovejoy

1976 Employment Benefits from Rural Industrialization.

Unpublished manuscript, Department of Sociology, Utah State University.

Objective: To examine the effects on local employment of a major power project

Method: Data are taken from 248 household interviews with residents of one northern Arizona and two southern Utah communities situated in the Four Corners area and near the proposed Kaiparowits power project. The Kaiparowits power project is a combined coal mining and electrical power generation project sponsored by a consortium of utilities. The respondents were selected by simple random sampling and were given open-ended interviews. All respondents were household heads.

Variables: The extent to which employment benefits of the Kaiparowits project might accrue to local residents, based on respondents' characteristics

Findings/implications: The authors suggest that, as with other rural development-industrialization projects in the United States, relatively few jobs deriving from the power generation project will go to local residents. The jobs that local residents will get are largely in the non-skilled categories. These projected benefits are substantially lower than the respondents anticipate. Four factors are seen to account for the meagre employment gains resulting from the Kaiparowits project: (1) a mismatch between project employment requirements -- generally, skilled jobs -- and the low level of job skills available in the local population; (2) an apparent unwillingness on the part of local residents to be trained or re-trained for employment; (3) a lack of desire on the part of local residents to apply for employment with the project; and (4) the communities are a long commuting distance from the project.

Lockeretz, William

1975 Growth of Residential Consumption of Electricity: Distribution among Households at Various Consumption Levels. Land Economics, Vol.51, 2 (May), 149-157.

Objective: To examine how households consuming different amounts of electricity have shared in the overall growth of residential consumption. This is important in determining whether the benefits of a continuing growth in consumption outweigh the mounting difficulties in providing additional supplies.

Method: Econometric analysis was conducted of the Missouri service area (about 580,000 households) of the Union Electric Company to determine how the monthly frequency distributions of residential consumption had changed from 1968 to 1973 for both base-load and peak-load months.

Variables: Electricity consumption of classes of consumers according to consumption levels

Findings/implications: Between 1968 and 1973, the relative overall growth was 43%, while peak-loads experienced a 40% growth. This was evenly distributed over consumer classes. The heaviest consumption group accounted for 38% of the peak-load increases, as compared to 8% for the lowest consumption group. During the base-load period, heavy consumers accounted for 49% of the increase, while low-level consumers accounted for 9%. The study indicates that any sort of policy which attempts to reduce consumption uniformly will result in regressive impacts on the low-level consumers as they account for very little of consumption growth. Policies should be directed towards the high-level or heavy consumers.

4440

Lopreato, Sally C.

1977 Citizen Attitudes with Respect to Energy Exploration and Development in one Texas County.

Paper presented at Social and Behavioral Implications of the Energy Crisis: A Symposium, Woodlands, Texas, June.

Objective: To study attitudes of local residents towards a prolonged energy development project

Method: A description and marginal frequency analysis was undertaken of a mail survey of citizens in a potential geopressured-geothermal testwell locality -- Brazoria County and six communities in Galveston County which lie within a 20-mile radius of the testwell site. A systematic probability sample (N=2364) was drawn from telephone books. The 612 usable returns (response rate of 26%) appear to be biased towards individuals at higher education and income levels.

Variables: Awareness of the resource, favourable attitudes towards the impending development, levels of community satisfaction and perceived future problems due to community growth

Findings/implications: More than half of the respondents were unaware of the resource. The large majority from all sections of the study area favoured test drilling and leasing the land for geothermal development. The wealthier and better educated were, in general, more supportive of such development. Sixty % of respondents proved sympathetic to the precedence of the nationwide need for energy (perhaps due to the altruistic wording of the question). Recommendations are made for resource development compatible with the interests and concerns of local citizens.

Lovejoy, Stephen B.

1976 Future Energy Development in the Western United States and Immigration.
Unpublished manuscript, Department of Sociology, Utah State University.

Objective: To examine the relationship between religious background and attitudes towards energy development projects

Method: A random sample survey of four rural communities (ranging in population size from 638 to 2250) in Utah was made during the summer of 1974. An open-ended interview was conducted with 337 household heads. All four communities are in the Four Corners region of the southwest.

Variables: The effects of the religious composition of immigration streams on local attitudes towards future energy development in Southern Utah -- particularly with respect to the "Kaiparowits project" (a combined coal mining and electrical power generation project sponsored by a consortium of utilities)

Findings/implications: Immigrants are less likely to practice the Mormon religion and less likely to support energy resource development than "locals." Non-Mormon immigrants were less in favour of the development of energy resources than either Mormon immigrants or long-term residents, regardless of long-term residents' religious beliefs. The author concludes by suggesting that immigration may have a greater impact on local attitudes in other rural areas of the western United States where religion is not such a primary influence on attitudes towards natural resources.

Lovejoy, Stephen B.

1976 Local Perceptions of Energy Development: The Case of Kaiparowits Plateau.

Unpublished manuscript, Department of Sociology, Utah State University.

Objective: To study attitudes of residents of the Four Corners region towards the Kaiparowits energy project

Method: A random sample survey of 407 household heads in five communities (Blanding, Monticello, Kanab, and Escalante, Utah; and Page, Arizona) in the Four Corners area of the southwest was conducted during the summer of 1974. Each of the five communities was in the proximity of and/or had experienced "energy resource development." The response rate was in excess of 92% and the interview schedules were composed of open-ended questions.

Variables: Opinions on the "Kaiparowits project" (a combined coal mining and electrical power generation project sponsored by a consortium of utility companies) in relation to perceived effects of the project

Findings/implications: The solid majority of residents of the five rural communities in the Four Corners region favour the Kaiparowits project. The author argues that local residents tend to overemphasize the positive effects of the project while deemphasizing or ignoring the negative consequences. He suggests further that these attitudes reflect a high level of misinformation on the part of the respondents, primarily because local residents received most of their information about the proposed project from the utilities and the news media who strongly support the energy development project.

Lowry, D.J. and W.S. Good

1977 The Energy Conscious Consumer: Implications for Marketing.
University of Manitoba working paper.

Objective: To uncover demographic-related variables which characterize the energy-conscious consumer

Method: The study reports on the results of a self-administered questionnaire mailed to two consumer groups randomly selected from six major English-speaking Canadian urban centres. Each sample consisted of 1500 households. One group was to represent the average Canadian consumer and the other was to represent the "energy conscious" consumer. The latter group was obtained from a random sampling of requests by Canadians from the six cities for a booklet entitled "100 Ways to Save Energy and Money in the Home." Four hundred fifty-one (30%) of the first group and 619 (41%) of the second group returned questionnaires in usable form.

Variables: Various demographic variables, exposure to and interest in print and broadcast media, lifestyle statements and attitudes towards energy

Findings/implications: It appears that the energy-conscious individual is much more sensitive to price and thinks of himself as someone who manages money wisely. Moreover, he is not an avid sports' fan or an outgoing, gregarious "life-of-the-party" type and he is more concerned with maintaining strong family relationships. He subscribes more to newspapers, is more concerned with the energy situation, is more likely to own his own dwelling, is well above average in terms of education, drives his own automobile and has a stronger drive for information than the average consumer.

Income and occupational status did not prove to be significant discriminators between the two groups.

Manning, W.G., et al.

1976 Design of the Los Angeles Peak-Load Pricing Experiment for Electricity.

(Publication No. R-1955-DWP)

Santa Monica, Ca.: The Rand Corporation

Abstract: The statistical and planned analysis of an experiment in peak-load pricing for residential customers served by the Los Angeles Department of Water and Power is described. A recently developed statistical tool, the Allocation Model, was employed to select those tariffs that minimize the variance of the answers to the policy questions of peak load pricing. Particular parameters on price and other variables of interest were found to contain standard errors generally less than 10% of the standard error of the equation. The statistical design of the model results in: 980 customers on 17 time-of-day tariffs with peak loads varying from three to twelve hours in length; 360 customers on four seasonal tariffs with peak prices varying from five to eight cents per kwh, with off-peak prices of two cents per kwh; and 400 customers on a conventional declining block tariff.

Market Facts of Canada Limited

1979 Residential Energy Conservation Attitude and Trade-Off Study.
Report prepared for Canadian Electrical Association, Montreal.

Objective: To summarize the main findings of a national electrical energy attitude and trade-off study

Method: A mailout questionnaire was used to define the specific issues to be examined. The responses (600) were factor analyzed to decide the issues. Personal interviewing was done for the actual survey, with 1,736 responses obtained for the attitude portion and 1,285 for the trade-off portion. Interviews were conducted in December 1978 and January 1979. All data are presented on a provincial and national basis.

Variables: Demographics: age, sex, occupation, education, income (the last three were combined into a socioeconomic status indicator, and respondents were assigned to low, medium or high groups) energy conservation behaviour; attitudes towards the future; energy conservation attitudes; electrical conservation attitudes; electricity pricing attitudes; attitudes regarding the competitive forms of energy; appliance use reduction; appliance use shifting; trade-off between sources of electrical power; trade-off regarding electricity price increases.

Findings/implications: Respondents tend most often to adopt energy conserving behaviour that requires the least effort and least discomfort. The poor conserving behaviour group includes more young people, males and people from the Prairie provinces. Many (70%) feel that within five years people will have to cut back on their use of electricity. People with low energy concern tend to be older, males, from the Prairies and to engage in less conservation behaviour. Nearly 50% believe that technology will solve the crisis, but 68% agree that if everyone learned not to waste energy, there would be no shortage. Respondents who say they would never give up modern conveniences to save energy are more likely to be older, female and of low socioeconomic status. Those who believe nuclear power stations are dangerous are more likely to be female, residents of Quebec and of low socioeconomic status. Nearly one-half (43%) were unwilling to accept the policy designed to increase the price of electricity used in the peak (5:00-7:00 p.m.) period in order to cut demand. Natural gas was viewed as the least expensive form of energy, while fuel oil was judged most likely to be available less in five years. Electrical power was seen as most reliable and electrical utilities were judged most interested in conservation and most honest with consumers regarding the energy situation. Gasoline was seen as most likely to double in price in the next five years. As a source of electrical power, hydro was preferred over fossil

Market Facts of Canada Limited (cont'd)

fuels and nuclear energy (73%, 16% and 11% respectively). A minority of respondents (22%) would still prefer hydro to nuclear energy even if it meant severe service reductions, was seen as most reliable and electrical utilities were judged most interested in conservation and most honest with consumers regarding the energy situation. Gasoline was seen as most likely to double in price in the next 5 years. As a source of electrical power, hydro was preferred over fossil fuels and nuclear energy (73%, 16% and 11% respectively). A minority of respondents (22%) would still prefer hydro to nuclear energy even if it meant severe service reductions, cutting appliance use generally by 20% and by 50% in the peak period. Middle-aged persons and those of high socioeconomic status were more receptive to nuclear power. Those with poor conservation behaviour and low concern for the future strongly valued availability, with less thought about the implications of how the power is produced. People (69%) would be generally ready to pay 1.2 times as much (as current prices) for electricity than to suffer any reduction in service. Only 12% would pay 1.5 times as much. People in the Atlantic region were most resistant to cost increases, while those in Quebec and the Prairies were most willing to pay more. If it meant severe reduction in service (see above) 100% would pay 1.2 times as much to keep up the service, and 91% would pay 1.5 times as much. If forced to choose among three reduced electricity service alternatives -- a slight reduction in energy use, shifting energy use or experiencing power interruptions -- respondents almost always chose the first or third alternative. If the choice was between severe reduction and weekly interruptions, the choices were divided almost equally between the three alternatives.

4815

Marylander Marketing Research Inc.

1976 Attitudes, Usage Patterns, and System Characteristics Among Owners of Solar Pool Heaters and Owners of Solar Water Heaters. Conducted for the San Diego Gas & Electric Company.

Objective: To provide an understanding of the types of solar pool heating and solar water heating systems in use and the owners' feelings about them

Method: Separate discussions were held in November 1976 with ten owners of solar pool heaters, and five owners of solar water heaters. Discussions were audio and video taped.

Variables: No statistical analysis was done. General conclusions were drawn from the discussions.

Findings/implications: The primary motivation for installing both solar water heaters and solar pool heaters was to save money on fuel. Owners were generally more technically oriented and solar water heater owners were especially emotionally involved with the solar heating concept. Both types of systems were viewed as sound financial investments, with approximately five-year payback periods. Owners had problems obtaining sufficient and accurate information about solar heating for their homes.

Mathematics, Inc.

1976 Impact of Energy Price Increases on Low-Income Families.
Federal Energy Administration.

Abstract: This report describes the development of a household energy consumption model which enables the Federal Energy Administration to explain and predict the distributional impact of energy price increases on households according to income groups. The model serves as a valuable tool in evaluating alternative energy policies and in choosing a means to alleviate the burden on low-income families.

Mauser, Gary A., Kendall, Ken W., and Pierre Filiatrault

1979 Feedback and Household Energy Use.

Burnaby, B.C.: Simon Fraser University, Department of Economics and Commerce. Discussion Paper 79-10-2.

Abstract: The objectives of the paper are: (1) to review the literature relevant to the use of information campaigns through the mass media and immediate feedback about the results of consumer behaviour, to influence consumer energy use; and (2) to describe a proposed study on energy use display meters. The most convenient method of changing consumption patterns is through impersonal mass communication. It appears that the magnitude of the potential personal threat conveyed by a message is more conducive to changing attitudes than the reported probability of occurrence. Research suggests that behaviour change due to presentation of information in the form of booklets, manuals, etc., may be minimal. A coordinated, master-planned, step by step procedure is needed to help the consumer along. Offering feedback on energy use through the use of energy bills from utility companies has shown some promise as a method of changing behaviour. Studies reviewed on behaviour modification and energy use feedback were criticized as being generally poorly designed and having questionable validity. While behaviour modification may be a viable technique for public policy applied to the industrial sector, it cannot be regarded very highly as a policy for the residential sector because it is so labour intensive. Automatic energy use display meters (EUDMs) are now being developed. Research completed suggests that although consumers reacted positively to the feedback concept, a strong educational program may be required to instruct them in the use of these devices. In general, feedback devices appear to have the greatest potential for inducing behaviour changes and producing monetary savings. A proposed study on EUDMs is outlined.

4830

Mazur, Allan

1977 The Effect of the Energy Crisis of 1973 on Public Attitudes Toward Nuclear Power.

Paper presented at Social and Behavioral Implications of the Energy Crisis: A Symposium; Woodlands, Texas, June.

Objective: To analyze and evaluate the author's 1976 prediction that there would be a marked decline in public opposition to atomic power plants

Method: The analysis is largely qualitative and exploratory. The proposition is tested that levels of opposition within movements, as well as fluctuations in the particular issues of concern, are tied to the rise and fall of topics of national concern in the United States. This pattern appears to hold for other controversies as well (e.g., fluoridation, the antiballistic missile system and legalized abortion.

Variables: The continuing interaction between topics of national concern and the intensity of popular movements opposed to nuclear power plants

Findings/implications: Although the Mazur-Leahy "wave" model did predict the rise of anti-nuclear sentiment pursuant to the Arab oil embargo, it failed to anticipate the recent opposition manifested in, for example, the Clamshell Alliance. The author interprets this failure to be a misapprehension of a new crest in the energy crisis wave. The new upsurge in public concern, as reported in Gallup Polls, is considered to reflect President Carter's attempt to publicize his energy program.

Mazur, Allan and Eugene Roas

1974 Energy and Life-Style.

Science, Vol. 186, 4164 (November 19), 607-610.

Objective: To study the long-term effects of reduced energy consumption on lifestyle

Method: The report is based on correlation analysis of the 1971 consumption patterns in 55 countries with population sizes of greater than seven million

Variables: Dependent: energy consumption (total and electricity)

Independent: indicators of health, education, culture, general satisfaction, and economic well-being

Findings/implications: Nearly all of the lifestyle indicators for all nations sampled correlate highly with the measures of energy consumption. Economic indicators generally retain high correlation with the measures of consumption. This indicates that a high level of consumption is required to maintain the lifestyle in developed countries. A question that is raised is whether or not energy consumption and economic indicators are measures of industrialization. If the per capita consumption remains relatively high in comparison to others, reductions can be made without any long-term redistributive effects on lifestyles.

Mazur, Allan and Beverlie Conant

1976 Controversy Over a Local Nuclear Waste Repository.

Unpublished manuscript, Social Science Program, Syracuse University.

Objective: To examine the controversy surrounding the proposal to site a nuclear waste repository near Syracuse, New York

Method: A random sample of local residents (selected from the residential phone listing in the 1976 Syracuse directory) was interviewed near the height of the publicity (N=124) and then nearly four months later, after the publicity had died away (N=106).

Variables: The effect of exposure to the controversy on attitudes by gender toward the proposed repository

Findings/implications: Men were three times more likely than women to be aware of the controversy. Yet exposure to the controversy had a greater effect on women than men, shifting female attitudes against the repository. The attitude formed at the peak of publicity tended to persist over time, particularly for men. The authors speculate that observed sex differences derive from our cultural expectation that men should know about politics and technology, and women need not.

4845

Mazur, Allan and Peter J. Leahy

1977 A Comparative Analysis of Movements that Arise in Opposition to Technological Innovations.

In Louis Kriesberg (ed.), Research In Social Movements, Conflicts and Change, Greenwich, Connecticut: JAI Press.

Objective: To study citizen movements against three technical innovations: fluoridation, the antiballistic missile system and nuclear power plants

Method: A qualitative, comparative study of citizen movements against three technical innovations: fluoridation, the antiballistic missile system (ABM) and nuclear power plants. Some consideration is also given to the movement against legalized abortion, inasmuch as it is a social innovation with technical overtones. Included are graphs of the number of articles appearing in the Reader's Guide indexed under various controversial topics over appropriate time spans.

Variables: The similarities and differences between three movements against technical innovations, to find the general principles of such movements

Findings/implications: There are similar patterns of leadership and growth in the movements analyzed. Leaders appear to be knowledgeable, reputable, well-integrated members of society. They oppose technology on grounds of ideology as well as risk. Such leaders are usually recruited by personal associates of a like political philosophy who are already in the movement. Mass media play a crucial role in a regular sequence of rise and fall of controversy. As media coverage increases so does opposition to the technology among the wider public. Coverage rises and falls with the activity of leaders. The authors suggest, based on this comparative study, that without the resurgence of opposition leadership the nuclear power controversy will diminish.

McClelland, Lou, and Laura Belsten

1979 Promoting Energy Conservation in University Dormitories by Physical, Policy and Resident Behavior Changes.
Journal of Environmental Systems, 9, 1, 29-38.

Objective: To describe two successive electricity conservation programs implemented in University of Colorado dormitories

Method: The first program was conducted between February and May 1977, involving six dormitories and over 1,800 student residents. The dorms were monitored for baseline electricity consumption, subjected to treatment and monitored for changes in usage. Interviews were conducted with dorm staff student representatives at the conclusion of the program. The second program, involving four dorms, was conducted from October to December 1977 and concerned an "energy challenge" whereby residents could earn monetary prizes through conservation vs. baseline. Thirty-five residents were interviewed at the conclusion of this program.

Variables: Dependent: actual energy consumption

Independent: the programs involved: (1) an appeal for conservation from university authorities; (2) information on how to save electricity; (3) posters and light switch labels; (4) discussions at floor meetings; and (5) monthly feedback letters

Findings/implications: During the ten weeks of Program 1, electricity consumption dropped to 84% of baseline in one group of four dorms, and to 88% in the other group of two dorms. In Program 2, consumption was 90% of the revised baseline in the dorms exposed to the challenge and 4% above baseline in the two control dorms. Consumption in the experimental dorms remained close to challenge levels during an eight-week period in the following term. The interviews suggested that the reduction was achieved in two ways: (1) physical policy changes -- including removing light bulbs and locking unused study rooms; and (2) changes in resident actions -- primarily shutting off lights. The monetary incentives had more effect and held a greater interest for residents than anticipated. In large institutions, physical and policy changes perhaps offer as large or larger potential reductions in electricity usage as changes in occupants' actions. Research is needed on the mechanisms through which any energy consumption reductions occur.

McClelland, Lou and Stuart Cook

1977 Encouraging Energy Conservation as a Social Psychological Problem
Boulder, Colorado: Institute of Behavioral Science, University
of Colorado.

Abstract: This paper discusses methods of encouraging residents of master-metered apartments to conserve energy and presents a framework used to structure research and to discuss relevant principles within this context. A study by the Midwest Research Institute found that master-metered apartments used 35% more electricity than individually-metered apartments. This is because there is little economic incentive to save, and because there is no feedback or any attempt to modify behaviour. Five methods of encouraging conservation are suggested: conservation incentives (rewards or punishments vs. baseline); conservation contests (vs. other subgroups in a building); individual conservation awards; variable energy billing (each tenant pays an equal portion of the building's energy bill); and a threshold energy bill (supplementary bill if over baseline). Management is concerned with the impact of the method on profits: administrative costs, protection from unexpected energy costs and the possibility of excessive payments (rewards) to tenants. Tenants are concerned with predictability, total cost, equity with management, equity with other tenants and time and "hassle". The effectiveness of a method, in terms of encouraging conservation, depends on number of factors: dollar amount (the research suggests that small incentives of \$5 to \$10 per family per month do not reduce consumption substantially); the type of transaction (rebate, making varying payment, paying a supplementary bill); whose conservation is reinforced (individual, subgroup, group); whether there is an incentive or a disincentive for conservation (or both); what action is required for the incentive to be given; and whether any non-monetary incentives are associated with the conservation result.

Empirical answers are required for the following questions: Does the size of an incentive make a difference or is its month-to-month variation more important? Is a variable payment, a bill for supplementary costs or a rebate most effective? Is the lack of a disincentive a critical problem in rebate methods? Might smaller incentives based on tenant behaviour only be more effective? How do all factors interact to determine effectiveness?

McDougall, G.H.

1980 Consumer Reaction to Energy Conservation Messages: An Experimental Design.
American Marketing Association, 1980 proceedings (forthcoming).

Objective: To determine the relative effectiveness of different energy conservation messages

Method: Personal interviews were conducted with 400 heads of households in London, Ontario. Reactions to two general and ten specific messages were measured.

Variables: Dependent: evaluations of the messages: (1) cognitive (what comes to mind as you view this message?); (2) a five-point scale of interest, perceived effectiveness for other consumers and the likelihood of calling for further information

Independent: all respondents were presented with the two "general" messages (one altruistic, one monetary) and two of the eight other messages. The other messages were of four types (infrequent, monetary general, behaviour-continuous, behaviour-infrequent) and concerned two situations (home heating or automobile)

Findings/implications: In terms of the cognitive reactions, the general messages were received more positively than the specific messages. The general messages were received positively by 67% of the respondents, with relatively high support for the "individual effort" message (36%). The most negative reaction was to a specific message where consumers perceived the expected benefits of the suggested action to be outweighed by the costs in terms of reduced comfort. The messages all scored fairly low on the scaled evaluations, and there was no significant difference between the three main treatments: home heating vs. automobile; specific vs. general; and intermittent vs. continuous. The messages may have a marginal impact until energy becomes a more important issue for consumers. The general messages in the experiment may have elicited a more favourable reaction because of the particular information presented in the specific messages. The most significant conclusion was that there may be a more productive means for policy makers to obtain energy conservation than through advertising.

McDougall, G.H., and G. Keller

1979 Marketing Energy Conservation in Canada: Implications from a Longitudinal Study.
In Administrative Sciences Association of Canada Marketing Division Proceedings, 70-83.

Objectives: (1) to examine Canadian consumers' attitudes and behaviour towards the energy situation over the previous four years; and (2) to identify and assess the available options for encouraging consumers to use energy efficiently and effectively

Method: The analysis is based on four annual surveys conducted by Energy Mines and Resources, Canada. Sample sizes in the four surveys, conducted from 1975 to 1978, were 1821, 1840, 1815 and 1808, respectively.

Variables: Dependent: level of concern regarding the energy situation; attitudes regarding government involvement in and possible solutions (policy options) for the energy problem; energy conserving behaviour

Independent: demographics

Findings/implications: Since 1975, Canadians have generally felt that the energy crisis is somewhat serious. Their concern stabilized in 1977/78, after an increase in 1976. An increasing proportion of Canadians stated that they were engaging in four types of specific energy conserving behaviour. Policies favoured were those which did not affect the respondents directly, did not cost them money or restrict their behaviour. Although from 1975 to 1977 some demographic characteristics emerged as significant in distinguishing concerned from unconcerned respondents, these differences were obscured in 1978. Policy makers must maintain or increase consumers' concern about the energy situation in order to motivate them to conserve energy. Perceptions about the effect of individual efforts in saving energy must also be at least maintained, so as to facilitate an increase in the incidence of energy saving behaviour. Governments must increase the participation in voluntary programs or face a difficult task in implementing mandatory programs effectively.

McDougall, G.H., & G. Keller

1980 The Energy Issue: Canadian and American Consumer Attitudes and Behavior (1973-1979).

Waterloo, Ontario: Wilfrid Laurier University, School of Business and Economics.

Objectives: To discuss consumers': (1) perceptions of the seriousness of the energy shortage from 1973 to 1979; (2) self-reported changes in energy-conserving behaviour during this period; and (3) policy preferences for potential solutions

Method: The Canadian data are drawn from a five-year (1975 to 1979) nation-wide study. Respondents (1,600 each year) were surveyed by telephone each April. The U.S. data are drawn from Gallup polls, conducted from 1973 to 1979.

Variables: Level of concern with respect to energy, government involvement in the energy situation, participation in energy conserving behaviour and possible solutions to the energy situation

Findings/implications:

Perceived seriousness Energy is generally perceived to be less important than the two traditional problems of inflation and unemployment (notably in Canada). In the United States, the situation is perceived to be more serious than it is in Canada. In Canada, the perception has declined since 1977, while in the United States it has remained stable.

Self-reported behaviour There are little data available in this area for the United States. In Canada, reported conservation behaviour has increased each year, which is surprising considering the decrease in the perceived seriousness of the crisis. This would imply that people are adopting conservation behaviour even though they feel the crisis is not serious. Increased energy prices may therefore have influenced behaviour.

Blame for the energy crisis In the United States, the federal government and the oil companies are blamed for the crisis. In Canada, in 1979, nearly 40% of respondents felt that the crisis was a hoax created by government, utilities and corporations. As well, 65% agreed that business was wasting far more energy than consumers.

Policy options In general, consumers prefer those policies which will not affect them personally. There is more support for government intervention in the United States (probably because Americans have experienced more shortages). Rationing is preferred to price increases, a situation reversed since 1975. In Canada, price increases and rationing are not well supported (22% and 25% of respondents would support them, respectively), while in the United States, 40% favoured gasoline rationing.

McDougall, Gordon H., Ritchie, J. Brent, and John D. Claxton

1979 Consumer Energy Use in Canada: Current Profiles, Future Policies.

In R.A. Fazzolare and C.B. Smith, (ed.s), Changing Energy Use Futures, New York: Pergamon Press (Vol. 2, 892-899).

Objectives: (1) to describe a framework employed for policy research and formulation with respect to consumer behaviour and energy use in Canada; and (2) to present selected findings from a national study on consumers' current views of the energy situation and their reaction to alternative energy policies

Method: A questionnaire was mailed to 3,000 households and 2,366 were returned. A second questionnaire was mailed to 1,952 of the respondents who were homeowners and 1,587 were returned. Actual energy use data for one year were obtained for those households.

Variables: Dependent: demographics

Independent: preference for policy alternatives, reported conservation behaviours, attitudes

All findings from the surveys are not contained in this particular paper.

Findings/implications: The three essential components of the framework include: (1) intervention focus (availability of products, purchase decision, use); (2) policy type (financial-nonfinancial, mandatory-persuasive); and (3) nature of the energy-consuming activity. Those who have lower education and incomes are more likely to believe that individual actions to conserve energy are futile and that energy conservation is the responsibility of the government and business, not the consumer. They also tend to believe that the crisis is contrived and generally engage in fewer types of conservation behaviour. Younger people (under 25) show greater acceptance of restrictions on energy consuming activities. Willingness to cut back on driving increases with the number of miles driven, but remains relatively constant after 15,000 miles (per year). "Heavy" drivers might engage in circumventing behaviour if policies restricting driving are implemented. Consumers tend to prefer policies aimed at product modification (allowing only cars which achieve 50 mpg, increasing appliance energy efficiency) to those that might affect them on a daily basis (doubling prices of gasoline and heating fuel, rationing).

4880

McGuire, B.J. and E.A. Vadelund

1975 Voluntary Labelling Program for Household Appliances and Equipment to Effect Energy Conservation: Annual Report for Calendar Year 1974.

National Bureau of Standards, Washington, D.C.

National Technical Information Report COM-75-10609.

Abstract: The Voluntary Labelling Program for Household Appliances and Equipment to Effect Energy Conservation, established in response to a Presidential directive, went into effect on October 16, 1973. The program covers only major energy consuming household appliances and equipment. The purpose is to encourage manufacturers to place energy efficiency labels on their appliances and consumers to use this information in making purchase decisions. Specifications containing labeling requirements for each type of produce were developed, two consumer information pamphlets were published and other consumer information and education activities were undertaken.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Meier, Alan K.

1979 Measuring Residential Energy Conservation.
In R.A. Fazzolare and C.B. Smith, (ed.s), Changing Energy Use Fu-
tures, New York: Pergamon Press (Vol. 1, 224-230).

Objective: To measure the energy savings achieved from a residential
energy conservation audit program

Method: The audit program, the Energy Conservation Inspection Ser-
vice (ECIS), was conducted in the summer of 1977. Universi-
ty students were trained as the auditors, inspecting some
250 homes who had requested the audit. The energy use of
four groups of homes was followed: (1) the audited homes;
(2) the do-it-yourself (DIY) homes (they received a package
outlining how to conduct their own audit); (3) cohort homes
(next to or near audited homes); and (4) the Berkeley aver-
age (data gathered from local utility company). Nine months
after the audit, 192 audited homes and 75 DIY homes were
telephoned to see how many conservation measures had been
followed. Actual energy use data were assembled for the
year prior to and following the audit.

Variables: Dependent: reported conservation measures, actual energy
use

Independent: treatment

Findings/implications: The audited homes did not report substantially
more conservation measures than the DIY homes. Energy con-
sumption in all homes exceeded the Berkeley average because
the Berkeley average includes apartments and many homes
which were smaller than the average audited home. Cohort
homes used roughly 10% more gas than those audited in the
year prior to the audit, indicating that those requesting
audits were more energy conscious. The results, on the
whole, indicate that no significant energy conservation oc-
curred. There were some problems in adjusting for the dif-
ference between the two winters. Some conservation did oc-
cur from one summer to the next, but both the audited and
the DIY homes experienced the same decrease in energy usage.
It may be that the effects of an energy audit are more
long-term in nature, relating to the purchase of more energy
efficient appliances, etc. However, it was expected that
some measures would be taken in the year following the
audit. The data suggest that this did not occur.

4890

Melber, Barbara D., et al.

1977 Nuclear Power and the Public: Analysis of Collected Survey Research.
Seattle, Washington: Battelle Human Affairs Research Center.

Objective: To provide a comprehensive review and analysis of existing survey data that deal with public attitudes toward nuclear power issues

Method: Twenty-nine national, 43 state, 12 local and 12 site surveys were included in the analysis. Most involved home interviews.

Variables Dependent: general attitudes toward nuclear power; attitudes about specific nuclear power issues (arguments for/ against, safety, health, waste disposal); general energy attitudes

Independent: demographics

Findings/implications: Support for nuclear power is widespread. Those in favour of nuclear power outnumber those opposed by a roughly two-to-one margin. Those most favourable tend to be better educated, higher paid, or middle aged. The most reliable differences in attitudes to nuclear power were related to sex with males generally more in support than females. Considerable fluctuation in attitudes was found over time; support has not increased, but there is no clear evidence that it has diminished. Residents near a nuclear plant are slightly more supportive and less opposed to having a nuclear plant nearby than the general public. The majority of the public is quite uninformed about nuclear power, but no relationship between knowledge and attitudes has been clearly demonstrated. The main reasons for supporting nuclear power have changed somewhat since 1960, when the main reason was the belief that it provided cheaper electricity. In the early 1970s it was supported because it was believed to pollute less. Since the 1973 embargo, it has been viewed as a needed power source. The main reason for opposition has been, since 1960, the dangers related to nuclear waste disposal and to accidents or explosions. The majority of the public believed that an accident could occur, that the probability of an accident is small, that the past safety record of plants has been good, and that technology can solve the safety problems of nuclear plants. Many preferred delaying expansion of nuclear facilities until further research could be completed but there was no general support for halting expansion forever. Over half the American public does not believe that there is or will be a very serious energy problem. There is general support for con-

Melber, Barbara., et al. (cont'd)

servation, but many do not believe that their conservation efforts will have a substantial impact and fear that conservation will reduce their standard of living. Young people are more in favour of conservation, most concerned with the environment and show low support for energy source alternatives except solar power. Older persons were more willing to relax pollution standards and build more power plants.

Meyers, Catherine E.

1979 Factors Affecting Willingness to Conserve Gasoline.
Albany, N.Y.: State Department of Transportation.

Objective: To determine the factors underlying consumer attitudes towards gasoline conservation; specifically, to determine which factors can be used to predict the willingness of travellers to conserve gasoline

Method: The data analyzed were collected in a New York State Department of Transportation (NYSDOT) 1977 Public Opinion Survey of 500 New York households.

Variables: Dependent: attitudes toward conservation of gasoline

Independent: attitudes toward other aspects of the energy crisis, demographics, travel behaviour

Findings/implications: Results show that willingness to conserve gasoline is highly independent of many primary demographic, behavioural and attitude descriptors. Generally, those who would be least affected by limited availability and high prices are most willing to conserve. The key findings regarding gasoline conservation attitudes were: New York City residents were more agreeable to conservation, likely because they have more transit options; those who used their automobiles for work trips were less likely to conserve; in terms of attitudes, those least agreeable to conservation were those who disagreed that highway tolls should be raised and those unsure that an energy crisis actually exists. The public favours policies which increase travel options and promote incentives for conserving gasoline, rather than those using travel restrictive and punitive measures. Increasing travel options include increased service availability (in terms of transit), increased cost availability (lowering transit fares) and increased perception of options (a program to improve practical knowledge of gasoline conservation). Encouraging conservation will not be easy but presenting a variety of options so that several advantages are perceived may increase willingness to conserve.

Miernyk, William H.

1975 Some Regional Impacts of the Rising Costs of Energy.
 Papers of the Regional Science Association, 37, 213-227.

Objective: To study the effects and regional consequences of high and rising energy prices

Method: A progress report of the early stages of a study which attempts to assess the consequences for regions is used. Data are summarized for production and consumption of basic energy resources by census region, by states for the distribution of incremental value added for coal, oil and natural gas, and for 78 sectors of the economy by rank of price effects.

Variables: The "between regions" economic effects of rising real energy prices

Findings/implications: Energy-consuming regions appear to be experiencing a shift in their interregional terms of trade, a trend which portends a shift in real per capita income among regions. The author concludes that there is no reason to believe that the differential impacts on energy producing and energy-consuming regions are less significant or less permanent than those that have recently altered the relationship among energy-producing and energy-consuming nations.

4905

Miernyk, William H.

1976 Regional Economic Consequences of High Energy Prices in the United States.

Journal of Energy and Development, 1, 2, (Spring) 213-239.

Objective: To study the regional consequences of the changing relationship between energy and other prices

Method: This is a largely qualitative and future-oriented study which relies upon historical, secondary data used from various statistical sources.

Variables: Regional patterns of economic activity in the United States as a function of changing energy availability

Findings/implications: Throughout much of the nation's history, energy-producing regions have "subsidized" the growth of urban areas via an abundant supply of energy at low and stable prices. Pursuant to the energy crisis of 1973-74, the energy-producing states have gained an economic advantage relative to the energy consuming states. The former are growing in population and economic activity and have experienced less adversity as a result of high energy prices. Based on these assumptions and trends, the author projects that there will be a regional shift of real income from the energy consumers to the energy producers. Thus, the coal-producing regions of Appalachia and the Far West could be transformed into relatively prosperous areas. Meanwhile, parts of some of the nation's most prosperous states -- such as Michigan and Connecticut -- could become chronically depressed areas. As such, a selective recession will hit certain energy dependent areas as the age of cheap energy comes to an end. Furthermore, a large amount of structural change will have to occur.

4910

Milstein, Jeffrey S.

1977 Energy Conservation and Travel Behavior.
 Association of Consumer Research Proceedings, 1977, Chicago,
 Illinois

Abstract: Americans use one fourth of the total amount of energy consumed in the United States in automobile passenger travel. This paper cites empirical data that illustrate that Americans appear to be making some progress in conserving energy by buying more efficient cars and driving slower on highways, but have made little or no headway in carpooling, using public transit and reducing vacation travel.

Milstein, Jeffrey S.

1977 Attitudes, Knowledge and Behavior of American Consumers Regarding Energy Conservation with Some Implication for Governmental Action.

Paper presented at Social and Behavioral Implications of the Energy Crisis: A Symposium, Woodlands, Texas, June.

Objective: (1) to investigate why American consumers favour energy conservation but generally do not practise it; and (2) to propose effective incentives and motivations for conservation

Method: The data are of two types: Opinion Research Corporation national probability sample surveys and focused group discussions. The surveys entailed telephone interviews of 1,000 to 1,200 people each accomplished monthly from August 1974 to April 1976 (see Opinion Research Corporation - Energy Polls). A total of 18 focused group discussions, led by trained leaders and lasting 1 to 1 1/2 hours, were held in Denver, Trenton, Hartford Seattle, Chicago and Nashville.

Variables: Attitudes and behaviour in relation to energy conservation

Findings/implications: Virtually everyone seems to be for conservation in the abstract, but evidence marshalled here suggests a gap between attitudes and energy conservation behaviour. Reasons for this seem to be lack of knowledge, cultural norms of comfort and convenience, and skepticism and cynicism regarding the nature of the energy problem. In speculating on prospective incentives, the author notes that a conservation ethic, patriotism or concern for one's progeny are not likely to induce energy conservation, but that the chance to save money may be the most effective incentive. Experimental analyses reinforce the view that financial reward is most effective in this regard, followed by feedback, exhortation, and information -- the least effective. All four methods are considered acceptable to the public and the author suggests that all of them be used, despite the fact that they vary in effectiveness.

4920

Milstein, Jeffrey S.

1977 How Consumers Feel About Energy: Attitudes and Behavior During the Winter and Spring of 1976-77.

Unpublished manuscript, Office of Energy Conservation, Federal Energy Administration, June.

Objective: To establish the effects on American consumers of the cold winters, natural gas crisis and the remedies to the energy crisis proposed by the Carter Administration

Method: A description and marginal frequency analysis was carried out of the results of several surveys of the American public done from February through May 1977. The analysis relies on a series of tables which summarize the surveys.

Variables: U.S. public opinions in connection with the winter 1977 shortage of natural gas and energy policy messages of the Carter Administration

Findings/implications: Three-fifths of respondents in the February survey thought the solution to the fuel shortage was in their own hands, yet energy conservation behaviour was minimal. A March survey also directly measured home temperatures, a tactic which yielded at least a 10% overall difference in fuel consumption between the temperatures people said they had and what they were directly measured to have. Turning off lights not in use and reducing driving are other frequently reported conservation efforts. However, the conservers in all instances were in the minority. Lack of knowledge about energy appeared to be a problem -- about half the people did not accept the shortage as real. Less informed people tended to be less receptive to calls for energy conservation and sacrifices and, conversely, two-thirds of respondents rejected the idea of a right to use as much energy as they want to or can afford to. Moreover, three-fourths felt that what individuals do counts, yet nine-tenths believe the government should help solve the crisis. With regard to the energy policy debate, people tend to prefer voluntary measures to compulsory ones, those that are fair to them to those that are not, and laws that provide incentives to those that penalize. The President's address seemed to produce significant changes in awareness of and attitudes towards the energy crisis. A dominant trend is that policy proposals which hit closest to home are the least preferred.

Mitchell, Bridger M., and Jan Acton
1977 Peak Load Pricing in Selected European Electric Utilities.
(Publication No. R-2031-DWP)
Santa Monica, Ca.: The Rand Corporation.

Abstract: The paper reviews the major features of rate structures for electricity in selected European utilities and contrasts the European practice of designing rates to reflect marginal costs with the traditional American preoccupation with rate-of-return issues. European electric utilities design their rate structures after analyzing the marginal costs of generating and transmitting power at high voltages. The highest marginal costs are incurred at different times, depending on the generating facilities of the particular utility. Rate structures should reflect not only the costs of generating the electricity but also the costs of distributing it. Distribution costs are a greater proportion of the total costs of meeting peak demand in a predominately hydroelectric system. Through the use of peak-load pricing, the European utilities have more accurately reflected the costs of supplying energy to their customers. They have also achieved significant reductions in peak-load usage by both industrial and residential customers.

Mitchell, Bridger M., Manning, Willard G., and Jan Acton
1977 Electricity Pricing and Load Management: Foreign Experience and
California Opportunities.
(Publication No. R-2106-CERDC)
Santa Monica, Ca.: The Rand Corporation.

Abstract: The paper's objectives are: (1) to review the principal factors that determine the costs of supplying electricity; (2) to assemble evidence of the extent to which consumers' loads are responsive to tariff provisions and load-management measures are able to achieve load shifting; and (3) to extrapolate the observed European response to peak-load tariffs to the industrial sector in California. European utilities have historically sold electricity at rates which reflect daily and seasonal differences in supply costs. They also use more active approaches to modify the load patterns of their customers. The structure of their rates is determined by the marginal costs of supplying the customer at the time of consumption. Some industrial firms adjust their production activities so they can economize on electricity consumed during peak hours. Some reduce their peak-load consumption by 25% to nearly 100% in response to the peak-load rates. The utilities also utilize active load management techniques in order to shift residential consumption to off-peak hours. If California utilities sold power to customers in certain industries under peak-load tariffs similar to those used in France, the amount of electricity used during the four-hour peak period could be reduced by 33% to 46% of current peak-hour statewide industrial demand. If the shift was extended to all industries, the load shifts would be some 80% larger. Reductions in peak-load would increase the efficiency of present electric plants and reduce the need for new plants in the future.

Mitchell, B.M., W. Manning, and J. Acton.

1978 Peak-Load Pricing: European Lessons for U.S. Energy Policy.
Cambridge, Mass.: Batlinger Publishing Co.

Abstract: An outgrowth of a continuing search for a more effective public policy in the electricity sector, this book is a comprehensive, three-part study of the theory of peak-load pricing, its practical application in European electricity utilities, and its implications for U.S. energy policy. Part I analyzes the role of electricity pricing in national energy policy and postulates the economic principles that should form the foundation for electricity rate structures. Part II examines, in detail, the practice of peak-load pricing in European utilities, and Part III explores the conditions and opportunities for its applications in the United States. The authors conclude with a summary of the policy issues involved in reforming electricity rate structures in the United States, and the prospects for putting peak-load pricing into practice.

Moncrief, Lewis W., et al.

1977 The Influence of Gasoline Prices and Availability upon Recreational Travel Propensity.
Energy Communication, Vol. 3, 5, 431-447.

Objective: To examine the relationship between gasoline conditions and travel propensity

Method: A survey was conducted of a sample (N=478) in 1974 in northeastern Illinois, northern Indiana and north and central Ohio. The study was aimed at interviewing travellers who had originated their journeys in Minnesota, Wisconsin, Michigan and Ontario.

Variables: Dependent: travel propensity, planned travel

Independent: income, gasoline availability, gasoline prices

Findings/implications: Most respondents did not change the numbers and durations of their trips. Lower-income travellers tend to travel less in terms of mileage and time, but the tourist industry relies heavily upon the upper-income groups. Gasoline prices and availability influenced travel decisions to a low level for 60% of the respondents, while 10% were severely influenced. Changes in travel behaviour were primarily reflected in the low-income groups. Furthermore, gasoline availability and prices did not significantly alter past and future travel decisions. Any attempts to affect changes in travel behaviour would tend to be regressive as low-income groups travel less and consume less energy but spend more of their income on energy.

Montgomery, David, and Dorothy Leonard-Barton

1977 Toward Strategies For Marketing Home Energy Conservation.
Stanford University Graduate School of Business, Research Paper
No. 372.

Abstract: The paper has two objectives. The first is to review much of the survey, experimental and other evidence relating to three major areas affecting consumer home energy conservation: economics; consumer knowledge, attitudes and perceptions; and social reinforcement and influences. Second, it discusses several marketing and research issues which will provide some rudimentary beginnings for market-oriented thinking relative to the problems of home energy conservation. The general conclusions, based on studies reviewed, were that: (1) price may be a powerful motivating force to conserve, but the price elasticity may be small and largely dependent on income; (2) the financial benefits of conserving devices are often far from obvious since consumers are unaccustomed to using life-cycle costing in their decision making; (3) the low prices of oil and natural gas inhibit the development of alternative technologies; more people now believe that an energy crisis exists but the mass media may be a poor tool for effecting actual behaviour change; (4) consumers fear that the burden will not be equally shared; (5) the perceived threat to comfort and lifestyle is a major barrier to efficient energy utilization; (6) another serious barrier is the lack of information; (7) information is most effective in the form of feedback on consumption at the time of consumption; (8) social reinforcement makes feedback more effective; (9) interpersonal communications are an important part of any diffusion process; (10) socioeconomic factors may not be the best primary segmentation basis -- home and household composition may be more important; and (11) a central clearinghouse for energy conservation information is desperately needed.

4950

Mooz, W.E., and C.C. Mow

1972 California's Electricity Quandary: I. Estimating Future Demand.
(Publication No. R-1084-NSF/CSRA)
Santa Monica, Ca.: The Rand Corporation.

Abstract: The report is intended to provide California state planners with a better method of estimating future electricity demand. The rate of growth in demand cannot continue at its present pace for it will soon outstrip California's ability to finance, build and even find room for generating facilities. An analytical forecasting model designed for use on a statewide basis was constructed. The model was applied to five cases of interest: the "anticipated" case, high and low growth cases, and two cases with energy price increases. Future demand is likely to fall far below what might be anticipated from a straightforward extrapolation of current consumption. Policies which raise the price of electricity in hopes of reducing demand may simply cause some customers to adjust to higher prices and others to switch to natural gas. Future demand projections must pay close heed to economic and demographic forecasts. A system is needed to collect more detailed energy data, both on demand and supply.

Morrison, Bonnie Maas

1975 Socio-Physical Factors Affecting Energy Consumption in Single Family Dwellings: An Empirical Test of a Human Ecosystems Model. Unpublished Ph.D. dissertation, Michigan State University.

Objective: To study the relationship between sociophysical factors and the belief in the reality of the energy problem, and total direct energy consumption in single-family detached dwellings

Method: Multiple step-wise regression and recursive path analysis were used to test the hypotheses. Data were gathered by interview, based upon a cross-sectional field survey, and drawn from a May-June 1974 multistage probability sample (N=97) of the Lansing, Michigan S.M.S.A.

Variables: The effect of the 1973-1974 energy crisis in terms of energy consumption characteristics and the beliefs of household members residing in single-family dwellings.

Findings/implications: Belief in the reality of the energy problem is positively related to mean (husband-wife) educational level, agreement (husband-wife) on the availability of electrical energy, and the reported total costs of all energy forms used in the dwelling unit (June to May 1974). The number of persons, major appliances and rooms in a dwelling unit contributed most to the variance explained with respect to energy consumption as a function of lifestyle and behaviour. Belief in the reality of the energy problem was not found to effect a change in energy consumption patterns.

4960

Morrison, Bonnie M., Keith, Joanne G., and James J. Zuiches
1979 Impacts on Household Energy Consumption: An Empirical Study of Michigan Families.
In Unseld et al. (ed.s), Sociopolitical Effects of Energy Use and Policy, National Academy of Sciences, Washington.

Objective: To examine the perceptions, attitudes, conservation practices and potential for further conservation of Michigan families regarding energy

Method: 216 families were interviewed in 1974 and 264 in 1976. The 1976 survey included 129 of the families surveyed in 1974.

Variables: Dependent: belief in the energy problem, actual energy use, perceived energy price increases, reported household conservation behaviour, perceived difficulty in future energy conservation, attitudes about energy prices and government actions

Independent: demographics

Findings/implications: Approximately 50% of the sample reported a belief in the energy problem in both years. Rural and less educated respondents expressed less belief in the energy problem. Many households reported daily conservation behaviour from turning out lights to lowering thermostats. Technical conservation measures (installing insulation, for example) were reported by fewer respondents. An aggregate reduction in energy use of 6.3% was found from 1974 to 1976 for the 130 families for which data were gathered. The range of changes was from a 43% decrease to a 45% increase. Energy costs were perceived by 60% of the respondents as being a "great problem." The reduction in energy consumption from 1974 to 1976 had no significant relationship with the householder's belief in the energy crisis. This might imply that price has forced some reduction in consumption, rather than a belief about the seriousness of the crisis. Reported behavioural and technical conservation changes for 1974-76 were analyzed for their impact on 1976 consumption; significant variables included installation of a new furnace, collective conservation behaviour, and installation of ceiling insulation. High energy users can afford to reduce energy consumption by more than the 6.3% found without greatly affecting necessities of living, but low energy users do not have the same flexibility. Nearly one-fifth of respondents reported they would have "great difficulty" in implementing further energy conservation measures. Non-believers more consistently reported that they would have difficulty. Thirty-one % reported that they would have no difficulty in implementing further behaviour. Respondents showed high concern for the environment, future generations and the consequences of present levels of material and energy consumption, which points to further potential for a decrease in energy consumption.

Morrison, Bonnie Mass and Peter Gladhart

1976 Energy and Families: The Crisis and Response.

Journal of Home Economics, Vol. 68, 1 (January) 15-18.

Objective: To study how family decisions are made about energy use in terms of energy use and attitudes, food consumption, transportation, housing, financial conditions and family mechanisms for coping with and adjusting to change

Method: A five year longitudinal study was undertaken of the Lansing, Michigan households with two or more members in the family. A multistage area probability sample survey was used for urban (N=160) and rural (N=57) areas.

Variables: Dependent: energy use, consumption

Independent: attitudes, food consumption, transportation, housing, financial expenditures and resources, family functioning

Findings/implications: Family income proved to be the single best indirect predictor of residential energy consumption. In general, families in the child-rearing stages use more residential energy than families without children or at the early or later family life-cycle stages. Larger families use more than smaller families. Single family homes use more energy than multifamily dwellings or mobile homes. Half of the respondents believed in the reality of the energy crisis but this did not diminish in any meaningful way the energy consumed in a household. Ecoconsciousness was associated with energy conservation and tended to be found in higher categories of educational level and occupational attainment. Urban and rural respondents differed on energy policies.

The implications of the study for policy making centre upon the focus of the impact. Policies should bear in mind the family characteristics which account for the various levels of consumption and should be directed to those who can easily adapt and assume the impact. However, the development of ecoconsciousness should be directed to the lower categories of the demographic attributes of the family.

Morrison, Bonnie M., et al.,

1977 Energy and Families: The Crisis and Response.
 Journal of Home Economics, Vol. 70, 5 (Winter) 18-21. Also re-
 ported in Family Energy Project Update: Response to the Increased
 Costs of Energy, A 1974-1976 Comparison.
 Paper presented at the annual meeting of the American Home Economics
 Association, Boston, June.

Objective: To study how families have responded to increased energy
 costs between 1974 and 1976

Method: An area probability sample of Lansing, Michigan households
 was used at each date with a sample size of 216 in 1974 and
 263 in 1976. Fifty-nine % of the households interviewed in
 1974 were repeated in 1976. Also, data pertaining to actual
 consumption were collected from the utility and fuel oil
 companies.

Variables: Dependent: consumption, attitudes on prices, sources of in-
 formation, belief in the energy crisis, policies and trans-
 portation.

 Independent: energy costs, income, education, sex, occupa-
 tion, residence

Findings/implications: There was only a slight decrease from 1974 to
 1976 of those who reported belief in the energy crisis, with
 about half in each case reporting so. The declines were
 substantial for rural residents, the less educated and
 older. There was a reported increase in types of behaviour
 reflecting awareness and conservation. However, wives re-
 ported a threefold increase in energy conservation and this
 reflected a higher level of ecoconsciousness, especially
 towards family behaviour, energy-efficient techniques and
 food perception techniques. Consumption decreased by 6.3%
 from 1974 to 1976 but families that are large, with a higher
 income and higher educational level consumed a greater per-
 centage of energy. Finally, in the area of policy, the
 majority favoured tax deductions or credits for insulation,
 one-car families, small families as well as daylight
 savings. Higher energy prices have, therefore, produced a
 positive impact towards conservation. However, the public
 tends to favour policies which they understand in terms of
 decreasing resources and policies which induce positive
 attitudinal growth.

Morris, D.N.

1974 Effects of Energy Shortages on the Way We Live.
 (Publication No. P-5377).
 Santa Monica, Ca.: The Rand Corporation.

Abstract: This report discusses the use of energy in personal transportation and residential buildings in terms of both primary energy (fossil fuels consumed) and kilowatt-hours or BTUs of direct consumption. Since energy prices may rise far beyond historical levels, consumer response to price increases is uncertain. However, energy conservation by municipal ordinance was highly successful in Los Angeles. Consumption of electricity dropped more than 17% below that of the previous year, which represents an even greater curtailment in that there would normally have been a 5% yearly increase. Moreover, the reduction has been maintained voluntarily. This success is probably due to the official stating of targets, allowing users to determine their own priorities of where to cut. A desirable strategy is to provide broad incentives for reducing energy use, while leaving the details to private initiative. Under these conditions, consumers can reduce their energy consumption by 20 to 30% without any great changes in the way they live and with no major hardships.

Morris, D.N.

1974 Some Comments on Conservation in the Use of Energy.
 (Publication No. P-5231).
 Santa Monica, Ca.: The Rand Corporation.

Abstract: The discussion in this report focuses on: (1) the advantages and problems of substituting natural gas for electricity, especially for residential space heating and cooling and water heaters; (2) the possibilities and problems of producing and using synthetic gas; and (3) ways of curtailing energy consumption. Both natural and synthetic gas will be in very short supply for the next ten years. Even complete deregulation of interstate gas prices will not increase domestic production. Offshore reserves will make no significant contribution for at least ten years. Transporting liquefied natural gas entails unresolved hazards. Production of synthetic gas from coal will take a few years, and generation of methane from organic material is still in the future. Some effective measures for conserving energy consumption might be to double prices on all forms of energy immediately, increase factory installed insulation on water heaters, reduce automobile weight, transport freight by railroads and waterways, and eliminate pilot lights on new gas appliances.

Morrison, Denton E.

1977 Equity Impacts of Some Major Energy Alternatives.

Paper presented at the Annual Meeting of the American Sociological Association, Chicago, September.

Objective: To assess the probable distributional impacts of increases in the relative real price of energy, both direct and indirect

Method: Data are arrayed for ten income classes by flows (monetary and energy) in 26 consumption categories. These data were recalculated from an input-output analysis of the 1960-61 U.S. Bureau of Labor Statistics' Survey of Consumer Expenditures. The input-output analysis (see Herendeen, 1974) is unique in showing the energy impact of consumer expenditures, thus opening the way for a determination of the relative distribution of energy by class. The analysis is brought to bear on social equity considerations related to price increases, energy conservation, coal development and nuclear development on persons and, to a lesser extent, on firms and communities, but especially on the poor.

Variables: The effect of some major energy alternatives on the distribution of energy flows, both direct and indirect, to social classes, firms and communities

Findings/implications: Higher energy prices are regressive, particularly because the poor derive a larger proportion of their energy from direct forms. Energy conservation would entail transfer payments if high first-cost conserving technologies are to be made available to the poor. Moreover, the affluent would have to reduce their consumption disproportionately, especially in connection with indirect and basic energy inputs. Nuclear and coal development could carry the seeds of inequitable risks and benefits. Inequity claims are briefly sketched in terms of quality of life. It is shown that the causal relationship of energy to quality of life is more essential for the absolute levels of the poor than of the affluent. A section is appended treating the equity impacts of six specific conservation strategies.

4990

Mow, C.E., W.E. Mooz and S.K. Anderson

1973 A Methodology for Projecting the Electricity Energy Demand in the Residential Sector in California.

(Publication No. R-995-NSF/CSRA).

Santa Monica Ca.: The Rand Corporation.

Objectives: (1) to characterize the pattern of electricity consumption in the residential sector; (2) to analyze the driving forces behind the end use; and (3) to develop a model for estimating future demand in California

Method: A survey was conducted of forecasting methodologies used by five major utility companies in California. The study bases its estimates on a study of the past 22 years and makes projections for the year 2000.

Variables: Dependent: consumption

Independent: kitchen end use; utility, lighting, maintenance end use; environmental/recreational end use

Findings/implications: Based on past data and future estimates, California will experience a high saturation of end use products and consumption. In kitchen end use, refrigerators and dishwashers will demonstrate the highest consumption and saturation growth by 2000. As for the utility, lighting and maintenance end use, washers and dryers will experience only slight growth in consumption and saturation. Space heating will continue to be the highest consuming sector of all end uses, with air conditioning demonstrating a moderate growth rate. Overall, California will experience a threefold growth rate in consumption.

The overall projections to 2000 indicate that California will experience a fairly high growth rate as well as product saturation. Price increases will be regressive on income distribution as the saturation of products changes to other forms of energy (natural gas). Wide-scale conservation programs, information labelling of products and an effective pricing mechanism, such as peak-load, are needed. If reductions in the projected demands are not attained, California could face supply problems.

Mowell, R.S.

1976 Recent Research on Residential Consumption of Electricity.
 (Publication No. P-5703).
 Santa Monica Ca.: The Rand Corporation.

Abstract: Electricity consumption by households was studied using 800 cross-sectional observations in Los Angeles County over 24 months. Also included were appliance stock data and actual temperature observations from six divergent climate zones. The study used the marginal price from one of six actual electricity price schedules faced by consumers. In addition, it incorporated a measure of the income effect or "lump sum" charge associated with the monthly customer charge and the area under the tariff schedule up to the block where consumption is observed. It was found that marginal price, household income, the appliance stock and the weather are important factors in influencing residential consumption. These factors should be taken into account in load forecasts of utilities. Feedback effects from price changes should be considered in rate hearings, as should estimates of distributional consequences of price changes.

5000

Muchinsky, P.M.

1976 Attitudes of Petroleum Company Executives and College Students
Toward Various Aspects of the Energy Crisis.
Journal of Social Psychology, Vol. 98, 2, 293-294.

Objective: To ascertain the attitudes of petroleum company executives and a sample of college students towards various aspects of the energy crisis

Method: This report is based on a spring 1974 survey and statistical analysis of the attitudes of 26 members of the Independent Connecticut Petroleum Association and 328 undergraduates at Iowa State University

Variables: Responses on causes, solutions, personal involvement, and present and future status -- all regarding the energy crisis

Findings/implications: In general, the students found the oil companies responsible while the executives faulted the government for the energy crisis. The energy crisis was ranked third in terms of importance, while social problems of economics and corruption in government were ranked first and second respectively.

Murray, James R., et al.

1974 The Impact of The 1973-74 Oil Embargo on the American Household.
Chicago, Illinois: National Opinion Research Center, University
of Chicago.

Objective: To report the findings of a continuous national panel survey
conducted by the National Opinion Research Center during the
winter of 1973-74

Method: The survey assessed changes in behaviour and attitudes of
the public, with N=331 for fuel oil and N=1946 for electri-
city and gasoline.

Variables: Attitudinal and behavioural responses related to fuel oil,
electricity and gasoline consumption, conservation behav-
iour, and reactions to year-round daylight savings time
(DST).

Findings/implications: Government and the oil companies were generally
held responsible for the energy crisis. Pervasive but
modest efforts at energy conservation were made by the pub-
lic. Two-thirds of respondents believed gasoline shortages
could be solved if individual consumers cut down on consump-
tion. Opinions concerning the energy shortage were not sig-
nificantly related to region, education, income or area of
residence. If rationing was required, more people (42%)
felt farm vehicles should be the first to receive fuel.
Large proportions reported conservation behaviour in house-
hold consumption -- heating (79%), electricity (84%) and
automobile use (64%). There was little evidence available
on the practice of the long-term measures (buying a smaller
car, retrofitting the home). There appeared to be a positive
relationship between total family income and reports of con-
servation behaviour. The majority preferred eight months on
DST and four months off. Reported energy savings during the
experimental DST period were minimal.

Murray, Michael P., et al.

1978 The Demand for Electricity in Virginia.

Review of Economics and Statistics, 60, 4 (November), 585-599.

Objective: To present a comprehensive demand study of the Virginia Electric Power Company (VEPCO), including an analysis of the two-part tariff aspect of commercial and industrial demand and seasonal variations in peak demands

Method: The analysis was conducted using monthly data from each of VEPCO's nine billing districts from 1958 to 1978.

Variables: Dependent: demand for electricity

Independent: temperatures, fuel oil prices, demographics

Findings/implications: There appears to be a strong correlation between load factor deterioration and both rising real incomes and rising real electricity prices. Electric utilities will have to improve load factors or else slow the deterioration. Demand elasticities varied considerably between and within customer classes (commercial/residential/industrial). Industrial customers are responsive to changes in prices of alternative fuels, a fact which must be taken into account when forecasting electricity demand. Model and model-free forecasts of residential demand produced very different results.

National Demographics Ltd.

1978 Evaluation of A Marketing Program Designed to Increase Consumer Consideration of Energy-Efficient Products In Denver, Colorado. Prepared for Office of Conservation, U.S. Department of Energy.

Objectives: (1) to discover whether the concept of "Energy Cost of Ownership" can help to accelerate the acceptance of energy-efficient and energy-conserving products; and (2) to determine what marketing/communications approaches would most effectively accomplish the program objectives

Method: A baseline survey of 357 homeowners, measuring consumer awareness and acceptance of energy conservation, was conducted in May and June 1977 in Denver, Colorado. A second survey of 506 homeowners was conducted after the program was completed in February 1977. Similar surveys were conducted at the same time in a control city (Salt Lake City, Utah).

Variables: Dependent: levels of awareness of energy conservation; attitudes toward energy conservation; intentions concerning energy conservation; existing levels of energy conserving behaviour; credibility of information sources; levels of awareness concerning the campaign and the retrofit sweepstakes

Independent: the "Energy Cost of Ownership" campaign, which consisted of television and radio advertising, a home energy retrofit sweepstakes promotion, retailer displays and a shopping centre display of a home energy use simulation; demographics

Findings/implications: Following the test, Denver residents were significantly more aware of the energy saving potential of various measures than were Salt Lake City residents. Awareness and recall of the marketing program was substantial, but the in-store promotional displays were relatively ineffective. There was some skepticism that energy savings could be translated into dollar savings on utility bills. Denver residents were more willing to pay more for products which conserved energy. There was, however, a mounting fear on the part of some that an energy conservation program would harm their standard of living. There was also a growing tendency to support the contention that others wasted more energy than they did and that these others were the ones who should be forced to save energy. On 10 out of 15 potential energy conserving measures, there was a significant increase in Denver residents' positive future consideration of those measures. They also reported a significant increase in a number of types of energy conserving behaviour (e.g., installing storm windows, regulating thermostats). The most

National Demographics Ltd. (cont'd)

credible sources of information were deemed to be scientists and the Department of Energy, followed by the media. Barriers to energy conservation programs do exist: some people have misperceptions about the potential costs and benefits to be derived from energy conservation; perceptions about the effects on peoples' standards of living; and the belief of some that they are already doing enough and that others should be forced to conserve. This points to the importance of an energy education program.

Nelkin, Dorothy

1974 The Role of Experts in a Nuclear Siting Controversy.
 Bulletin of the Atomic Scientists, Vol. 30, 9 (November), 29-36.

Objective: To shed some light on the relationship between the distribution of experts and public participation by considering a case in which citizens were well prepared with technical services and well organized to participate in a technical decision

Method: A qualitative study was conducted of the role of academic experts in the 1973 case of organized community opposition to the construction of a nuclear power plant on the shore of Cayuga Lake, New York.

Variables: The influence of academic experts on the controversy over construction of a nuclear power plant

Findings/implications: The report's main conclusions were that: (1) in a controversial situation, political values can permeate technical material itself, whether or not the experts intended it; (2) public sentiment tended to reflect nontechnical considerations; and (3) technical advocacy is likely to encourage participation in technical decisions and to increase the probability of controversy.

Neveu, Alfred

1977 The 1973-74 Energy Crisis: Impact on Travel.
Albany, New York: State Department of Transportation.

Objective: To examine changes in travel behaviour during the Arab oil embargo so as to aid government in developing policies to induce such changes

Method: Pre-embargo travel behaviour was viewed by studying data gathered in a home interview survey taken in Buffalo, New York, in October and November 1973. Subsequent travel behaviour was examined by reviewing a number of studies done during and after the embargo.

Variables: Dependent: gallons of gasoline used per week

 Independent: age, sex, number of cars owned

Findings/implications: Some patterns of travel behaviour are apparent:
 (1) men drive more than twice as much per day as do women;
 (2) travel increases at a decreasing rate as auto ownership increases; and (3) the 21 to 50 age group travels more than other age groups.

The general conclusions evident from studies reviewed are that: (1) the supply of gasoline is a more important factor in determining travel demand than price; (2) only those with flexibility in travel behaviour do the consuming and they are those with higher incomes and more automobiles; (3) price increases in gasoline will severely impact lower-income drivers and will hardly affect others; (4) transit is not an important option in combatting the gasoline shortage (because of poor service and high fares); and (5) lower-income travellers are less likely to change travel patterns but more likely to retain the changes.

Policies using price to reduce gasoline consumption will be ineffective among higher-income households, who have the greatest potential to conserve, and will severely impact lower-income families. They should be aimed at the group with flexibility in its travel behaviour.

5220

Neveu, Alfred

1977 Public Opinion Survey On Energy and Transportation.
Albany, New York: State Department of Transportation.

Objective: To learn more about the public's beliefs and opinions concerning the energy problem and possible conservation policies

Method: A telephone survey of 500 New York State residents was conducted in the fall of 1977.

Variables: Dependent: opinions on general approaches for conserving energy and specific conservation policies

Independent: residential location, sex, age

Findings/implications: General results are that: (1) most people (85%) feel there is an energy problem in the United States, with rural residents less inclined to agree; (2) perceived primary causes of the problem include wasting energy, not developing new sources and using up energy sources; (3) efforts to save energy should not be concentrated in any one area but should be split between homes, industry, business and government; (4) in terms of saving energy in the transportation sector in New York, there is more support for encouraging transit use within cities and between cities; (Encouraging people to cut gasoline use has strongest support in rural areas and among young people.) (5) incentive programs are favoured over tax and rebate programs to cut gasoline consumption, with strong support for carpool incentives and enforcing the 55 mph speed limit; (6) transit use within cities might be increased by lowering fares and increasing service; and (7) the elderly and handicapped should be given special attention when planning energy saving action in transportation.

5225

Newfoundland Light & Power Co. Ltd.

1978 Comparison of Annual Space Heating Costs of Oil Heated and Electrically Heated Townhouses.

St. John's: Energy Use Services, Customer Services Department.

Objective: To compare the annual heating costs of a group of oil-heated townhouses and a group of similar electrically-heated townhouses in the St. John's area

Method: Two groups of approximately 50 townhouses each, one with oil-fired warm air heating and the other with electric baseboard heating, were monitored for energy use over a 12-month period from November 1976 to October 1977.

Variables: Actual recorded fuel and electricity consumptions

Findings/implications: A number of factors were present that might tend to distort the comparison: the efficiency of the oil systems was greater than what it would be over the life of the system; the electrically heated units were more exposed to high winds; and the oil units heated slightly larger areas (two % larger). It was suggested that the net effect of these may be offsetting. The actual recorded fuel and electricity (for space heating only) comparisons show a 4.5% difference in favour of the oil-heated units. The study recognized, however, that electrical heating, because of its inherent advantages such as cleanliness, comfort, room-by-room control, convenience and better use of space, is considered preferable to other forms of space heating at some premium above the equivalent operating cost of other systems. The study concluded that, at current (1978) prices and rates, the cost of heating townhouses electrically compared favourably with the cost of heating by oil-fired warm air systems.

Newfoundland Light & Power Co. Ltd.

1977 Report to the Board of Commissioners of Public Utilities of Newfoundland on Bulk-Metering.

St. John's: Newfoundland Light & Power (NLP).

Abstract: The paper reports on the practice of bulk metering in Newfoundland and indicates the probable revenue and cost consequences to Newfoundland Light and Power (NLP) and its customers. There is a trend towards less bulk metering. It is very costly to change the metering arrangement once installed. Studies examined on the subject of bulk vs. individual meters indicated that electrical consumption was 35% (Medwest Research Institute) and 39% (Ontario Hydro) higher for bulk-metered buildings. These studies, however, dealt only with the oil-heated apartment buildings, and did not compare total energy use by bulk- and individually-metered buildings. Data were available on two apartment buildings in Newfoundland which had converted their meter systems: one which changed from bulk to individual meters experienced a 10.2% decrease in consumption; another which changed from individual to bulk experienced a slight (3%) increase. The cost to NLP and its customers of converting all existing bulk-metered residential installations to individual meters is greater than the potential savings.

5235

Newman, Dorothy K., and Dawn Day Wachtel, (ed.s)

1975 The Energy Gap: Poor to Well Off.

In Ford Foundation Energy Policy Project Report: The American Energy Consumer, Washington, D.C.: Ford Foundation.

Objective: To describe how poor, middle-income and well-off families use energy

Method: The analysis is based on data from the Washington Center for Metropolitan Studies Lifestyles and Energy Surveys, conducted from May to June 1973 (household interviews) and June to September 1973 (acquisition of billing data from utilities) on a nationwide multi-stage area probability sample (N=1455) of heads of households.

Variables: Energy consumption characteristics relative to income class characteristics

Findings/implications: The poor use less energy, pay relatively more for the energy they must have and, more than any other American group, suffer from exposure to the residuals of energy production/consumption. The energy gaps were found to be greatest in gasoline.

Newman, Dorothy K., and Dawn Day Wachtel, (ed.s)

1975 Energy in the Home.

In Ford Foundation Energy Policy Project Report: The American Energy Consumer, Washington, D.C.: Ford Foundation.

Objective: To study the role of consumer choice in home energy use

Method: The analysis is based on secondary data from a variety of sources and on the Washington Center for Metropolitan Studies Lifestyles and Energy Surveys, conducted from May to June 1973 (household interviews) and from June to September 1973 (acquisition of billing data from utilities) on a nationwide multistage area probability sample (N=1455) of heads of households.

Variables: Consumer choice in relation to: personal energy use distribution; type of structure and heating fuel; mean annual total cooling degree days; size of home; presence of insulation and other physical housing characteristics; energy use characteristics and changes in these for regions and specific characteristics (e.g., heating fuel use and square feet of floor space); appliances, water heating and air conditioning.

Findings/implications: On the average, space heating is the most important energy use in the home, accounting for almost a third of all personal energy use. Water heating uses about one-tenth. Cooking and refrigeration each use about 3%, with other appliances and lighting composing the remaining 9%. With regard to consumer choice, this study is more oriented towards the prescriptive than descriptive, although numerous data are reported on actual consumer and housing market behaviour.

Newman, Dorothy K., and Dawn Day Wachtel

1974 Energy, the Environment, and the Poor.

Paper presented at the Annual Meeting of the Society for the Study of Social Problems, August.

Objective: To study the interrelationships between energy, environmental quality and poverty

Method: 1972-73 figures from the Washington Center for Metropolitan Studies Lifestyles and Energy Surveys are used. The survey used is based on a stratified national sample (N=1455) of households. A second survey (N=142) asked utility companies serving the sample households how much electricity and natural gas the households used and how much they paid for it in the most recent 12 months.

Variables: The effect of changing patterns of energy consumption on the poor and their environment

Findings/implications: At the time of the study, currently accepted fuel pricing bore heavily on respondents who were least able to afford it. The price of fuel was found to be higher for those who use it as a necessity and cheaper for those whose demand is more a matter of lifestyle. Authors conclude from their data analysis that the question of which households use energy for what purposes is intimately related to the question of how the rapid growth in household energy consumption can be slowed. Further, curbing of the growth of energy consumption is extremely important for slowing the spread of pollution.

Newsom, Theodore J., and Udit J. Makranczy
1978 Reducing Electricity Consumption of Residents Living in Mass-Metered Dormitory Complexes.
Journal of Environmental Systems, 7, 3, 215-235.

Objective: To investigate the effects of a monetary incentive for energy conservation on electricity consumption of students residing in mass-metered university dormitories

Method: The subjects were 1,567 undergraduates living in six dorms during the summer term. There were two treatments: (1) a contest (two dorms) -- each house (approximately 65 students) in the dorm reducing electricity consumption the most would receive \$30; (2) a contest-raffle (two dorms) -- the same, except that the \$30 was to be raffled off to an individual in the winning house. Two dorms served as the control group. Resident assistants were interviewed by telephone about residents' reactions.

Variables: Dependent: electricity consumption

Independent: treatment; sex

Findings/implications: During treatment, electricity consumption decreased in the experimental dorms: contest dorms reduced consumption 11% and 1%; contest-raffle dorms 7.2% and 1.5%; and control dorms increased consumption 1.9% and 3.7%. The decreased consumption continued after the contest was over, indicating possible residual or lingering effects. There was a difference in the decrease by sex: female-inhabited dorms did not do as well as the male-inhabited dorms. Group rewards were preferred to individual awards (hence the greater reductions by the contest only dorms). Residents of the female dorms felt that the contest was unfair to them, because they were more concerned with safety and security (they were averse to turning out hall and washroom lights) and used more electrical appliances than did the males. The dollar savings (\$150) from reduced consumption did not cover the incentive payments (\$180). Potential benefits would be greater if the program lasted longer.

Nietzel, Michael and Richard A. Winett

1977 Demographics, Attitudes and Behavior Responses to Important Environmental Events.

American Journal of Community Psychology Vol. 5, 2, 195-206.

Objectives: (1) to evaluate procedures designed to encourage residential energy conservation; and (2) to examine attitudes toward energy conservation, attitudinal change over time, perceptions and values of alternative solutions, and attitudes and behaviour regarding energy conservation

Method: A survey was carried out of 304 residents of Lexington, Kentucky over three periods: the winter of 1973-74, late winter 1974, and early spring 1975. The study compared various energy conservation techniques for students and residents over time.

Variables: Dependent: attitudes and perceptions regarding causes, solutions, responsibility for solution, conservation, incentives for conservation

Independent: students, residents, time

Findings/implications: Most students and residents reported that the major cause of the energy crisis was high levels of use by individuals. The main solution, as perceived by both students and residents, is the development of new resources. Furthermore, the responsibility for the solution was perceived as being with the federal government. Both students and residents favoured a direct payment or deductions from bills as incentives for conservation. Time had no effect upon responses concerning either causes or incentives. However, time did affect belief and behaviour in terms of decreases in the seriousness of the problem and a lesser amount of conservation behaviour. Further research is needed to examine a number of more direct incentives, such as tax rebates, utility rate reductions, legislation and peak-load pricing. However, belief in the energy crisis is positively related to conservation behaviour.

O'Brien, T. V. and Debra Campbell

1976. Arizona Energy Policies - A Statewide Citizen Survey.
Arizona Business, Vol. 1, 23, No. 4, 9-13.

Objective: To examine consumers' attitudes towards various aspects of the energy problem.

Method: A random sample survey was conducted throughout the state of Arizona.

Variables: Attitudes that Arizonans have towards the energy sources currently used as well as those under development

Findings/implications: Arizonans agree that the United States should achieve energy independence in the near future. They see the energy problem as genuine but their views on specific energy sources are a mixture of confidence and doubt. Solar power was strongly supported in all areas of Arizona. People were opposed to tax incentives to oil companies. Arizonans favour more information and education with regard to energy and believe that public utilities should take the initiative in this area.

5610

Odum, Howard T., et al.

1976 Net Energy Analysis of Alternatives for the United States. In Hearings Before the Subcommittee on Energy and Power of the Committee on Interstate and Foreign Commerce, House of Representatives, Ninety-fourth Congress, Middle- and Long-Term Policies and Alternatives: Part I. Washington, D.C.: U.S. Government Printing Office.

Objective: To analyze the U.S. economic system in terms of flows of energy from domestic sources, from the environment and from international exchanges using system level models

Method: "Energy analysis" produces estimates of net energy (i.e., energy yield minus that needed to collect and process the original energy). Part and parcel of energy analysis is a system of symbols for describing energy flows and storages. The secondary data were transformed into fossil fuel equivalents and were derived from a variety of statistical sources.

Variables: The net energy values of present and proposed types of energy sources and their current and likely future effects on the U.S. economy

Findings/implications: In view of the net energy constraints pursuant to declining stocks of fossil energy resources, it was determined that the present levelling trends in the U.S. economic system will not be reversed. Moreover, energy analysis diagrams suggest that when energy sources decline, the very high quality sectors of the economy on the end of the energy chain decrease most. Steady state regimes (leveled economies) are projected for the United States and suggest sharp changes in public viewpoint and public policy if a smooth transition is to take place. Net energy analyses are discussed for the following cases: cooling towers, tertiary treatment, interface ecosystems, environmental technology generally, the harvest of environmental products, industrialized agriculture and housing density. Public policy predictions based upon net energy analysis are provided for domestic energy sources, imported petroleum and project independence, deficit financing, unemployment, military defence, environmental protection and energy pricing.

5615

Office of Energy Conservation

1975 An Examination of Measures Designed to Encourage Energy Conservation from the Perspective of Motivation Theory.
Canadian Office of Energy Conservation, Report RR5.

Abstract: Various types of programs that use the science of psychology of motivation to encourage the conservation of energy are examined. The conditions under which such programs are most likely to succeed and the critical elements needed by the programs to yield maximum effect are discussed. The challenge of the psychology of motivation is both to create a tendency to behave in an energy-conserving manner and to make that tendency stronger than energy-consuming tendencies. Intrinsic and extrinsic motivational techniques are examined and the advantages and disadvantages of both are described.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Olsen, Marvin E.

1977 Public Acceptance of Energy Conservation.

Paper presented at Social and Behavioral Effects of the Energy Crisis: A Symposium, Woodlands, Texas, June.

Objective: To review and synthesize survey research studies conducted since the 1973-74 oil embargo

Method: This report reviews and synthesizes of survey research studies conducted since the 1973-74 oil embargo. The review provides the basis for evaluating the relative effectiveness of persuasion, pricing and pressuring as strategies for increasing public acceptance of energy conservation.

Variables: The state of knowledge about public acceptance of energy conservation

Findings/implications: A rather rapid and extensive shift has recently occurred in American public opinion towards awareness and acceptance of the energy problem, but the practice of serious energy conservation is not yet a significant feature of American life. Should they become necessary, the public appears ready to accept energy conservation policies that are rigorous by present standards.

5625

Olsen, Marvin E., and Christopher Cluett

1979 Evaluation of the Seattle City Light Neighborhood Energy Conservation Program.

Prepared for Seattle City Light by Battelle Human Affairs Research Center, Seattle.

Objectives: (1) to determine whether a neighbourhood-based energy conservation program is an effective means of promoting residential energy conservation; (2) to evaluate the relative effectiveness of the various aspects of the City Light program; and (3) to suggest ways for citywide application of the program

Method: The program was conducted in three neighbourhoods, each receiving a different treatment: Green Lake (neighbourhood information campaign only); Haller Lake (block workshops only); Mt. Baker (both). Home energy checks were conducted on request. An initial questionnaire was sent to 905 residences and 484 usable responses were obtained. Workshop critiques from 96 subjects were analyzed. Those responding to the initial questionnaire were interviewed by telephone in October (368 interviews completed). Written questionnaires were sent to these people as well, with 243 returning a completed copy. Thirty all-electric homes (and controls) were monitored for electricity consumption.

Variables: Dependent: actual energy consumption

Independent: treatments: (1) neighborhood information campaigns -- open meetings, articles in local newspapers, flyers and (2) block workshops -- meetings conducted in local home, noting possible conservation steps; energy conservation attitudes, knowledge and behaviour; demographics; household characteristics; dwelling unit features

Findings/implications: Most people are aware of the seriousness of the energy problem and the need to conserve, but many strongly resist taking simple, inexpensive conservation actions. The sociodemographic factors generally provide no clues about who will or will not conserve energy. The workshops definitely increased awareness of energy issues and practices but the program did not increase people's concern about the energy problem or cause them to adopt more favourable attitudes towards energy conservation. People did gain more information about energy conservation techniques, but the gain was small. The program prompted many people to take conservation actions but there was little spillover to friends or neighbours not directly involved in the program. All-electric homes exposed to the program used significantly less electricity during the summer than did control homes (3.2 KWH per day). Income and household size are positively related to energy consumed. People are willing to upgrade their home's insulation, especially if they feel energy

Olsen, Marvin E., and Christopher Cluett (cont'd)

prices are going to rise. They are concerned about the cost of the investment and the payback period (they will generally accept 4.5 years on a \$600 investment). Home energy checks were clearly effective in increasing conservation actions, so all residents should be encouraged to have them. Workshops should be used to elicit requests for home energy checks. Existing organizations in neighbourhoods should be used to disseminate energy information and to encourage energy conservation activities. The primary emphasis in terms of home improvements should be placed on actions that can be completed by residents themselves, with a maximum cost of \$500 to \$600 and a payback period of less than five years.

Olsen, Marvin E., and Jill A. Goodright
1977. Social Aspects of Energy Conservation.
Northwest Energy Policy Report.

Abstract: Findings from existing social scientific studies of energy conservation attitudes and behaviour demonstrate that the U.S. public has thus far adopted only minimal conservation practices. Six strategies for implementing energy conservation programs are analyzed. Informational and persuasive techniques are relatively worthless. Pricing and incentives can be quite effective for altering specific practices. Governmental regulation and guidance can produce more extensive changes in energy consumption. Several possible social implications of energy conservation are examined, including quality of social life, socioeconomic equity and the development of a conservation ethic, all of which could be effected by extensive energy conservation programs.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

5635

O'Neill, Harry W.

1974 The Effects of Energy Availability and Costs on Consumer Attitudes and Behavior.

1974 Proceedings of Association of Consumer Research, 5th Annual Proceedings, Volume 2, 863-878.

Objective: To report some of the findings from a longitudinal survey research program conducted by the Opinion Research Corporation

Method: The research was nationwide and conducted by telephone interview (from January to October 1974). Initially, 400 interviews were conducted in each two-week "WAVE"; this was increased to 600 per "WAVE" in mid-August 1974.

Variables: Independent variables included price and other factors related to energy shortages. The major dependent variables were self-reported purchase intentions and usage rates.

Findings/implications: The major findings were that: (1) in March 1974 only 33% of the sample shopped for the best gasoline price but, by July 1974, 51% were looking for the best price; (2) 60% of the sample found the price of gas unreasonable in comparison with most other things; (3) 60% of the sample also reported using their car less because of the price of gasoline; (4) a very large proportion of the public favoured increased information to enable the consumer to conserve energy; (5) over three-quarters of the population supported reduced speed limits, approximately half the sample favoured regulation of energy use but only 16% were in favour of gasoline rationing; (6) there is great opposition to price increases as a means of controlling energy usage; (7) two-thirds reported using fewer lights; (8) about half reported using appliances less often; (9) over 80% said they were driving slower in order to conserve energy; (10) 72% were shopping at stores closer to home, almost 70% were shopping at fewer stores; six of ten were shopping less often and over half were cutting down on window shopping to save energy; and (11) over half were using less electricity because of the cost.

Opinion Research Corporation

1974 Reports on Energy Polls,
through (Available from National Technical Information Service, U.S.
1976 Department of Commerce, Springfield, Virginia 22151).

Objective: To determine ongoing public attitudes and behaviour in reaction to the costs and availability of energy.

Method: Surveys were conducted monthly for 20 months, beginning September 1974, using telephone interviews. The samples (usually N=600-1200 interviews/month) were randomly drawn on a nationwide basis from selected adults in households having telephones. Analysis techniques used include frequencies and cross-tabs (multiple regression in the study on reasons for using mass transit).

Variables: See individual listings below.

Findings/implications: Mostly detailed tables without discussion; see individual listings below.

Volume I. Opinion Research Corporation 5640
1974

This survey was based on 1,213 telephone interviews conducted over a fourweek period ending September 6, 1974. Question areas and results include: (1) respondents had come to believe that energy shortages are both a serious and long-term problem; (2) the degree to which respondents think the energy shortage is serious correlated strongly with whom they hold responsible; and (3) consumer groups were seen as the most trustworthy source of information. Additional results are presented on energy-related knowledge, solutions to the energy crisis, car pools and packaging.

Volume II. Opinion Research Corporation 5645
1974

This survey was based on 1,210 interviews conducted from September 15 to October 15, 1974. The survey involved the following areas and results: (1) there was a small decline in trust in the federal government as an information source between the end of August and the beginning of October; (2) perceptions of reasons for the energy shortage are reported; (3) the majority of respondents thought Congress should legislate minimum miles per gallon for autos; and (4) the majority indicated that public transportation for shopping is available. Five areas having policy implications were also investigated: gasoline tax policy, foreign trade policy, natural resource availability, home lighting and home heating. For gasoline tax policy and natural resource availability respectively, results show that most respondents are strongly opposed to any rise in taxes in order to cut down usage, and they appear to hold themselves responsible for doing a poor job of conserving natural resources.

Volume III. Opinion Research Corporation
1974

5650

This survey concentrates on residents of all-electric homes and is based upon 100 personal interviews conducted among residents in two all-electric communities in West Chester, New York. The purpose of the study is to determine how higher electric rates have affected behaviour and whether residents are responding to higher rates through organized political action. Results are reported for the following variables: construction of the home, cost of heating, amount of the yearly heating bill, total electric cost during the past 12 months, incidence of television sets and political action of residents outraged over increased electrical rates.

Volume IV. Opinion Research Corporation
1974

5655

This survey deals with energy consumption and attitudes of families with income under \$7,000 and people 50 years or more in age. Results are reported for the following variables: seriousness of the energy shortage, length and severity of the energy shortage, the energy shortage as real vs. contrived, personal conservation efforts and their impact on total consumption of energy, attitudes towards specific government policies, changes in shopping habits as a result of inflation, cash payment vs. charging, means of transportation and personal effects of the energy shortage.

Volume V. Opinion Research Corporation
1974

5660

Energy consumption and attitudes toward the energy shortage are the focus. Issues that are considered and on which results are reported include: seriousness of the energy shortage; duration of the energy shortage; perceived severity of the shortage; the energy shortage as real vs. contrived; the effect of shortages on the public; satisfaction with President Ford's energy measures; efforts made to save energy; results of the price increases on behaviour, including the use of cars influenced by shortages, the use of cars influenced by price, leisure activities and hobbies at home.

Volume VI. Opinion Research Corporation
1975

5665

Consumer attitudes towards gasoline prices, shortages and the relationship between the latter two and inflation are explored.

Respondents were categorized according to whether their cars averaged under 15 miles per gallon, 15 to 19 miles per gallon or 20 miles per gallon or more, and were categorized by average miles driven per week as follows: under 30 miles, 30-99 miles, 100 miles or more.

Data are reported on the following variables: reasonableness of gasoline prices, efforts to save energy, concern for gas mileage, attitudes towards rationing vs. higher prices, higher prices for low mileage cars, higher taxes on gas vs. taxes on cars, the environmental costs of producing more energy, environmental threats of energy self-sufficiency, power plants and pollution, water and air pollution, the impact of less car usage on the rate of inflation and the sponsoring of advertising on gasoline mileage.

Volume VII. Opinion Research Corporation
1975

5670

Consumer attitudes and behaviour resulting from issues surrounding the energy shortage are analyzed. The report is divided into: (1) highlights from the Opinion Research Corporations energy impact program (Waves 20-21); (2) analysis of the role of education on attitudes and behaviour; (3) data on the type of fuel used for home heating and its effects on consumer behaviour attitudes; and (4) a synthesis of available data dealing with the public's willingness to pay for pollution controls and environmental cleanup. In addition, the report includes data on the rising cost of electricity, rationing, the role of education in attitudes towards strip mining, energy self-sufficiency, power plants and oil refineries as a cause of air pollution, and oil heat users.

Volume VIII. Opinion Research Corporation

5675

This report is concerned with such national problems and issues as unemployment, inflation, energy shortages, rationing vs. increased prices, increased oil import taxes, pollution control requirements and nuclear power plants, sensitivity to rising gasoline prices, public awareness of the Federal Energy Administration (FEA) and specific FEA advertisements, certain energy-saving efforts among the general public and lack of public motivation and belief in the existence of an energy crisis and public attitudes towards nuclear power plants, including thermal pollution, radiating discharge, nuclear accidents or disposal of radioactive wastes.

Volume IX. Opinion Research Corporation
1975

5680

This report focuses on: the seriousness of the energy shortage; methods for solving the energy problem; inflation and increased prices, unemployment, and the rebate plan; the role of rebates to encourage installation of storm windows and insulation; attitudes towards gasoline use and taxes, including concern with automobile gas mileage; appliance purchases, including the price of appliances and the electricity they consume; and public attitudes towards returnable bottles and cans.

Volume X. Opinion Research Corporation 5685
1975

This study of energy saving is divided into five parts: (1) responsibility for conservation of natural resources; (2) public awareness of the Federal Energy Administration; (3) attitudes and behaviour related to daylight savings time; (4) automobile usage and attitudes toward alternatives; and (5) insulation of homes among the general public.

Volume XI. Opinion Research Corporation 5690
1975

Public attitudes with respect to energy related issues are dealt with, including attitudes toward nuclear power plants, the impact of school programs on home energy consumption, factors affecting the public's use of mass transit and company efforts at energy conservation. In connection with these categories the following variables are considered: the role of the school in emphasizing energy conservation; efforts of children to conserve at home; efforts of children to recycle; car pooling in relationship to long distance mass transit; availability of public transportation; interest in public transit for shopping; drawbacks to using public transportation; the likelihood of using buses if special lanes were provided for them; the impact of increased travel time; the type of mass transit most needed; and money for mass transit vs. highways.

Volume XII. Opinion Research Corporation 5695
1975

This study is concerned with vacation including weekend, and business travel, attitudes regarding beverage containers and a regression analysis of the reasons for using mass transit. The following variables were involved: travel miles anticipated, kinds of trips taken, duration of trips, types of transportation, places visited, number of miles traveled, effect of the energy situation, regional differences in the availability of containers; the type of container preferred and the type purchased, reasons for container selection, public reaction to deposit containers, attitudes towards mass transit and the mass transit available as a means of going to work.

Volume XIII. Opinion Research Corporation 5700
1975

This study of the energy-related attitudes and behaviour of the poor and elderly is divided into three parts: (1) major problems in the United States and how they affect the poor and the elderly; (2) plans for 1974 income tax rebates; and (3) tradeoffs in pollution vs. price. Respondents had fam-

ily incomes of under \$10,000 or were 50 years of age and older. Interview items for which results are reported include: problems facing the United States today, such as rising unemployment, inflation and the energy shortage; looking ahead at the problem of unemployment; the impact of inflation; the potential of income to keep pace with prices; fuels used in households; perceived and projected increases in prices of fuels; attitudes towards selling food to other nations; and ways to spend tax rebates.

Volume XIV. Opinion Research Corporation
1975

5705

This report concentrates on patterns of automobile usage and is based on 1,007 telephone interviews. Variables include: car usage as affected by lifestyle, car usage patterns, planned trips as compared with routine or spontaneous trips, times per week that a trip is usually made, analysis of trips, the extent to which shopping trips are done by phone instead of by car, willingness to cut out trips and factors deterring car use. Findings suggest that the primary way that people could cut down automobile use without eliminating leisure time use would be in more careful planning of trips for shopping and errands. Another important finding is a lack of sensitivity to gasoline price increases.

Volume XV. Opinion Research Corporation
1975

5710

This is a study of opinions on these three issues. Respondents recognized that the era of cheap energy is over but also believed that consumption of foreign oil ought to be reduced and domestic resources developed. Variables involved perceptions and attitudes related to opposition to increased dependence on foreign oil, the fear of a natural gas shortage this winter and concern over the need to save energy.

Volume XVI. Opinion Research Corporation
1976

5715

The report contains two parts: an executive summary and detailed tabulations of the questions. The findings of questions to the public on air pollution controls are summarized: (1) 62% do not regard air pollution as a serious problem where they live; (2) motor vehicle exhausts (55%) and factories and plants (52%) are seen as the most important causes of air pollution; (3) many people are willing to back up their commitment to less air pollution with money; (4) in some cases, people are willing to change to more energy-conserving behaviour rather than pay additional money to lower air pollution; (5) people show a desire to prevent a significant deterioration of air quality; and (6) 94% think areas that have clean air should be kept as clean as they are now.

Volume XVII. Opinion Research Corporation 5720
1975

Public behaviour and attitudes towards conserving home heating fuel, gasoline, electricity and hot water are surveyed.

Volume XVIII. Opinion Research Corporation. 5725
1975

This report gives the results of a survey of attitudes towards natural gas.

Volume XIX. Opinion Research Corporation 5730
1976

This report addresses: (1) individual predispositions towards energy, saving behaviour, (2) the importance of energy saving, and (3) the likelihood of other people's conserving energy. It was found that past behaviour is generally regarded as the most accurate predictor of future behaviour patterns.

Volume XX. Opinion Research Corporation 5735
1976

A nationwide probability sample survey of 1,004 respondents was conducted by telephone beginning October 24 through November 9, 1975. Most respondents believed that a serious need to save natural gas exists in the United States and they expressed a willingness to personally make efforts to conserve it. They understood that heating homes consumes a great deal of natural gas, and had taken steps to conserve home heat. Many respondents did not realize that it takes a great deal of energy to heat water. Nor did they understand how natural gas supplies are allocated. They believed that natural gas should be conserved in order to save natural resources for the future. Because of this, respondents seemed receptive to reliable, credible information on how to conserve effectively.

Volume XXI. Opinion Research Corporation 5740
1976

A nationwide probability sample survey of 1,207 respondents was conducted by telephone from November 26 through December 21, 1975. These data indicate that most drivers drive in ways that save gasoline. Ninety-six % stop pressing the gas pedal when they see a red light; 84% plan several errands for one trip; 84% have their car engine tuned at least once a year; and 84% drive 55 mph on major highways. The major exception is that 69% drive themselves to work, whereas only ten % use carpools or take passengers, eight % take public transit and five % walk to work.

Volume XXII. Opinion Research Corporation
1976

5745

A nationwide probability sample survey of 1,016 respondents was conducted by telephone from December 30, 1975 through January 15, 1976. The survey showed most people's home use of energy to be tied to their beliefs regarding what constitutes energy saving, especially with respect to home heating, insulation, electric lights, water heaters and washers, dryers and dishwashers. Forty-nine % reported setting their thermostats below 69 degrees F during the day and 15% at or below 60 degrees F at night; 79% said their homes are insulated; 55% turned lights off when leaving the room for a short time; and 42% did not know to what temperature their water is being heated. Results show that beliefs about energy consumption affect the way people behave; therefore, the report concludes, people should be informed through public education efforts of more energy-efficiency measures.

Volume XXIII. Opinion Research Corporation
1976

5750

A nationwide probability sample survey of 1,002 respondents (606 of whom were living in households with children under 18 years who were attending school) was conducted by telephone from January 27 through February 25, 1976. The results indicate that a substantial amount of energy information had been transmitted to American homes by children who obtained such information in school. Information about energy conservation was welcomed. Parents seemed particularly interested in home heating and lighting information and wanted more information on saving gasoline. Parental behaviour and attitudes were reflected in children's behaviour and attitudes, and vice versa. Most respondents felt sponsorship of energy-saving school programs by utility companies and government to be appropriate. Children's television programs, publications and organizations were perceived as good means of communicating energy information to children.

Volume XXIV. Opinion Research Corporation
1976

5755

A nationwide probability sample survey of 1,203 respondents was conducted by telephone from March 22 through April 19, 1976. Despite two years of energy shortage, nearly one respondent in eight (13%) did not believe it to be a real problem and only five % saw the energy problem as U.S. dependence on foreign oil supplies. They preferred saving energy around the home in ways that would not entail physical discomfort, (e.g. weatherproofing the home rather than raising the setting of air conditioners or lowering thermostats). Respondents appeared responsive to "lifecycle"

Volume XXIV. Opinion Research Corporation (cont'd)
1976

pricing information in terms of purchasing choice. Income tax credits were regarded as more potent incentives than guaranteed bank loans for homeowners to make energy conservation home improvements. Respondents wanted the government to provide them with information on how to save energy.

Organization for Economic Cooperation and Development
1976 The Energy Label: A Means of Energy Conservation.
 (OECD Report No. 48).

Abstract: Domestic energy conservation could be facilitated by the use of an energy label that would indicate to consumers the efficiency of a household appliance. At present, four OECD member countries -- Canada, France, Switzerland and the United States -- have introduced or are planning to introduce an energy label for certain domestic electrical appliances. The newness of this concept implies that problems of standardization among various countries may exist. Whether the labels should be voluntary and their actual effectiveness are debated.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Organization for Economic Cooperation and Development

1977 The Energy Label: One Way to Conserve Energy.
 OECD Observer, 85 (November), 20-23.

Abstract: Residential energy consumption accounts for 20 to 40% of total primary energy consumption in OECD countries. One method of promoting energy conservation at the family level is to encourage the usage of energy labels on appliances which show exactly the amount of energy consumed by each product. Obstacles to legislating the use of energy labels center around difficulties in standardizing such a system.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Otway, Harry J., et al.

1978 Nuclear Power: The Question of Public Acceptance.
Futures, Vol. 10 (April), 109-118.

Objective: To test a methodology that might be used more generally to understand which factors differentiate between groups for and groups against nuclear power

Method: A pilot study was developed which uses factor analysis to determine the parameters of the groups for and against nuclear power. A survey was conducted of 224 people in various parts of Austria who are associated with university-affiliated energy research institutions.

Variables: Dependent: psychological risk factor, economic and technical benefits, social-political risks, environmental-physical risks

Independent: pro-con group, attitude contributions, belief, evaluation

Findings/implications: The pro-group attributes their attitudes to the economic and technical benefits of nuclear power, while the con-group emphasizes the risk aspects, especially the psychological and social risks. The pilot study produces a number of implications for future research and policy making. First, a risk estimation study is helpful in determining those risks which are perceived as being too high to facilitate change. If change does occur, however, it is necessary to develop a more favourable attitude. Furthermore, attitude sensitivity is directly related to observable changes. When these are not observable, the public tends to be reluctant until further information is obtained.

6005

Pacific Gas and Electric Company

1979 Final Report: Residential Energy Utilization Analysis -- Concord Pilot Study Program Evaluation.

Market Research Report 79-7.

Concord, Ca.: The Pacific Gas and Electric Company.

Objective: To evaluate the overall effectiveness of the Concord Pilot Program in conserving energy in the home.

Method: There were three treatments: In-Home (IH), in which a trained representative performed a detailed energy analysis, making recommendations for conservation (N=291); Do-It-Yourself (DIY), in which a packet of material was sent to homes outlining the analysis (N=542); and control (N=466). Respondents were self selected for IH and DIY. Two hundred representatives of each treatment group were interviewed. Criteria for inclusion in the experiment included: owner-occupied, single-family, dual-service dwelling; 12 months of the consumption data available from The Pacific Gas and Electric Company; and above average energy consumption.

Variables: Demographics, actual consumption before and after treatment; treatment, attitudes

Findings/implications: No group saved significantly more or less energy than any other. The two experimental groups did not decrease energy consumption significantly. The DIY audit is recommended as it is cheaper and had the same effects as the IH audit. There were no differences in terms of demographic variables between those involved in the treatments. The IH sample was, however, generally more concerned about the energy situation than was the DIY sample.

Pallak, Michael S., Cook, David A., and John J. Sullivan

1980 Commitment and Energy Conservation.

In L. Bickman (ed.), Applied Social Psychology Annual, Vol. 1, 235-253.

Objective: To investigate the effect of commitment on energy-related attitudes

Method: Data collected in two studies conducted in 1973 and 1974 in Iowa City, Iowa were analyzed. A total of 212 persons participated in the experiments. There were three treatments: public commitment, private commitment and control. One study involved natural gas consumption and the other electricity. Consumption was monitored for one month after the interview (treatment). Consumption was later also monitored for the following 12 months.

Variables: Dependent: changes in natural gas/electricity consumption

Independent: treatment.

Findings/implications: In both cases, in the month following the treatments those making a public commitment significantly reduced their consumption (vs. control). Those making a private commitment did not. In the natural gas study, over 12 months those making a public commitment significantly lowered consumption relative to control and private commitment. Similar results were found for the electricity experiment. In the natural gas study, the effect of commitment was limited to the six-month season in which the gas was used for heating. A similar pattern was found for those with window air conditioners in the electricity study. For those with central air conditioning, no such pattern was evident. A short (six-week) study of the effects of usage vs. comparative feedback showed that comparative feedback resulted in lower rates of increase (during air conditioning season) than simple usage feedback.

Pallak, Michael S. and William Cummings
1976 Commitment and Voluntary Energy Conservation.
Personality and Social Psychology Bulletin, 2 (Winter), 27-30.

Objective: To explore the effect of commitment on energy-conserving behaviour

Method: Two experiments, one focusing on use of natural gas (N=65) and the other on electricity (N=142), were conducted respectively in October 1973, just prior to the Arab oil embargo, and in June 1974 in Iowa City, Iowa. These figures represent the total number of participants including control groups. Subjects were interviewed to establish personal identification (public commitment) or no identification (private commitment) in agreeing to attempt energy conservation. The response measure of energy usage was provided by utility meter readings for the month after the interview.

Variables: The effect of commitment, public or private, on energy conserving behaviour

Findings/implications: Homeowners under public commitment showed a lower rate of increase in the use levels for both experiments than under private commitment or in the control (no interview) group. Results from a set of self-monitoring conditions suggest increased attention to energy use levels as a possible cause of conservation behaviour.

Palmer, Michael H. et al.

1977 An Experimental Analysis of Electricity Conservation Procedures.
 Journal of Applied Behavior Analysis, Vol.10, 4 (Winter) 665-671.

Objective: To study the effects of an experimental analysis of procedures to reduce the daily electricity consumption of residential consumers.

Method: Two feedback conditions -- daily knowledge of electricity cost and daily knowledge of electricity consumption -- and two prompt conditions -- daily requests for conservation and a letter from government officials requesting a decrease in consumption -- were examined in connection with the consumption behaviour of four Des Moines, Iowa families. The daily consumption of the families was recorded from meter checks for a 160-day period (February 2 to May 19, 1974). A baseline condition was established for all four families before the experimental conditions were applied.

Variables: Dependent: electricity consumption

 Independent: experimental conditions (prompts - feedbacks)

Findings/implications: Electricity consumption was reduced in three of the four families. In the first family, the baseline consumption of 29 kwh per day was reduced to 23 after cost-feedback information was given. A second treatment of cost information reduced consumption to 14 kwh per day. However, a return to baseline conditions increased consumption to 18 kwh per day. The second family experienced the following results: baseline -- 33 kwh per day; cost information -- 29 kwh per day; second baseline -- 33 kwh per day; government prompts -- 27 kwh per day; and third baseline -- 22 kwh per day. The third family experienced: baseline -- 22 kwh per day; government prompt -- 18 kwh per day; prompts and feedback -- 14 kwh per day; second baseline -- 19 kwh per day; and prompts and feedback -- 14 kwh per day. The fourth family experienced a reduction after the government prompts were introduced but, as with the third and first families, consumption increased when baseline conditions resumed except that it was lower than the original baseline.

The results indicate that prompting and feedback are helpful in reducing consumption. However, little information was available on how the families' behaviour changed, except that wives were the main focus of conservation activities. The authors suggest consequence control over stimulus control in government programs to encourage energy conservation.

Patterson, Arthur H.

1974 The Effect of the Winter 1973-74 Energy Shortage Upon Attitudes About Preserving the Environment.
Unpublished manuscript in the Philadelphia and Centre County areas of Pennsylvania.

Objective: To examine the effects of the energy crisis on attitudes concerning the preservation of the environment

Method: A two-wave telephone questionnaire (December 1973 and February 1974) of a random sample of 60 homeowners in the Philadelphia and Centre County areas of Pennsylvania.

Variables: The effect of the energy crisis on attitudes about preservation of the environment, based on a ten-item attitude scale containing nine-point Likert-type items on, for example, the importance of clean air and pure water. Data were also collected on self-reported energy consumption patterns.

Findings/implications: A significant difference of post-crisis attitudes between those who heated their homes with fuel oil and those who used natural gas or electricity was noted, the former rating environmental quality as less important than the latter. This suggests that attitudes towards preserving the environment will become more negative as the costs to those holding the attitudes increase.

6030

Peat, Marwich, Mitchell and Co.

1976 A Marketing Approach to Carpool Demand Analysis.
Technical Memorandum I, Survey Documentation.

Abstract: The memorandum details the survey design and methodology employed in connection with a research effort which examined the role of individuals' attitudes and perceptions in deciding whether or not to use carpools. The study was based on a survey of commuters in three major urban areas and examines respondents' socioeconomic and work trip characteristics, travel perceptions and travel preferences.

Peck, A.E., and O.C. Doering, III.

1976 Voluntarism and Price Response: Consumer Reaction to the Energy Shortage.
 Bell Journal of Economics, 7, 1 (Spring), 287-292.

Objective: To test the effectiveness of the national conservation policy in creating voluntary alterations in consumption habits

Method: An econometric study was undertaken of changes in the efficiency of household use of two heating fuels, natural gas (N=174) and liquified petroleum (LP) gas (N=279) from 1971 to 1974. Price data were from two private gas companies (converted to an index with April 1971 as the base period) for the towns of Romney and Battle Ground, Indiana. A correction was made for temperature differences between winters.

Variables: The effect of national conservation policy (and the energy crisis) on fuel-use efficiency of LP gas and natural gas

Findings/implications: For LP gas customers, fuel-use efficiency increased some 14.4%, while for natural gas customers it increased only 5.8%. The latter increase was not significant at the .05 level. The authors suggest that, among rural users of the types sampled, voluntarism evidently cannot be relied upon to reduce consumption substantially. They interpret the results as reinforcing the need for higher prices to induce fuel-use efficiency.

6040

Perlman, Robert, and Roland Warren

1975 Effects of the Energy Crisis on Households of Different Income Groups.

Paper presented at the Annual Meeting of the Society for the Study of Social Problems, San Francisco, Ca.

Objective: To determine the differential income effects of the energy crisis

Method: A November, 1974 multi-stage probability sample (N=1440 households) of Hartford, Connecticut, Mobile, Alabama and Salem, Oregon was analyzed to determine the differential income effects of the energy crisis.

Variables: The effect of the energy crisis on income groups in terms of energy conservation behavioural patterns and the impact of the energy crisis on attitudes and opinions

Findings/implications: In some activities, especially home heating, the well-to-do conserved relatively more energy but did so from a much higher energy consumption level and still used more after their adjustments than the poor. This greater absolute usage applies in all other categories as well (e.g., automobiles, appliances and electricity). Well-to-do people appeared to have relatively more options for making energy-related adjustments.

Perlman, Robert, and Roland L. Warren

1975 Energy-Saving by Households in Three Metropolitan Areas.
Waltham Massachusetts: Brandeis University, Florence Heller
Graduate School for Advanced Studies in Social Welfare. Report
No. 1 of the Energy Impact Study.

Objective: To study the impact of energy problems on households of different income levels and social characteristics in three areas which vary by climate and particulars of the energy situation

Method: A study was conducted of the impact of energy problems on households of different income levels and social characteristics, and how these adjustments vary in areas where the energy situation and the climate differ. This report is devoted to an analysis of aggregate energy-saving behaviour in three metropolitan areas -- Hartford, Connecticut, Mobile, Alabama and Salem, Oregon. Interviews were conducted in November 1974 on households selected from a multistage area probability sample (Ns respectively of 658, 483, and 243).

Variables: The effects of energy costs on respondents, particularly in terms of energy-saving behaviour.

Findings/implications: A high proportion took steps to conserve all forms of energy during the winter of 1973-74, even though 62% thought the shortage was contrived to boost oil and gas company profits. Hartford is in an area most dependent on imported oil and reported the greatest efforts to save energy. Heating proved less critical in Mobile. Salem, with very low electric power rates, made less of an attempt to curtail electricity consumption. Households reported a reduction of 1.7 degrees in home heating and a drop in the speed of highway driving from 63 to 55 mph, both compared to the previous winter. Some activities were cut back less than others. For example, shopping, visiting and recreation were curtailed more than driving children to school and after-school activities and the use of dishwashers and clothes dryers was reduced far more than the use of televisions and freezers. Carpools and walking tended to be substitutes for driving, rather than public transportation. Price, instead of a sense of civic duty, was the most frequent explanation for energy conservation in driving and home heating.

6050

Perlman, Robert, and Roland L. Warren

1975 Energy-Saving by Households of Different Incomes in Three Metropolitan Areas.

Waltham Massachusetts: Brandeis University, Florence Heller Graduate School for Advanced Studies in Social Welfare.

Objective: To examine the relationship between income and energy related behaviour and attitudes

Method: A sample survey of 1440 respondents was taken during November 1974 in Hartford Connecticut, Mobile Alabama and Salem Oregon.

Variables: Family income in relation to energy-conserving behaviour, behavioural changes in the aftermath of the energy crisis and perceptions of the causes of the energy crisis.

Findings/implications: Income is positively (but only moderately) related to belief in the reality of the energy crisis and income differences in these beliefs were less pronounced than regional variations. Upper-income families reported cutting down on heating fuel use more than lower-income families, but there were only small differences among income groups in reported conservation of gasoline and electricity. There were no clear income-related patterns in the reduction of driving. Even though high-income families made the greatest reductions in home heating use, their average room temperatures remained higher than those of low-income families. Reductions in energy use were most pronounced where rates/costs were highest.

6055

Perlman, Robert, and Roland L. Warren

1977 Families in the Energy Crisis: Impacts and Implications for Theory and Policy.

Cambridge, Massachusetts: Ballinger Publishing Company.

Objective: To develop a general appreciation of how American families are affected by crises like the energy crisis of 1973-74, how they respond and how their adjustments to crisis give rise to further effects on the families themselves and on other institutions in society

Method: Personal interviews were conducted in November 1974 in approximately 1,440 households and 600 business establishments. A follow-up mail survey was taken of 1,440 households in August 1975, with 757 usable responses obtained. As well a telephone survey of 154 of the households was conducted in August 1977.

Variables: Demographics; actual consumption of electricity, natural gas and fuel oil (obtained for 215 of the households); energy conservation behaviour; general perceived effects of the crisis; attitudes about the seriousness and cause of the crisis; preference for policy alternatives

Findings/implications: Many people blamed self-serving economic and political motives for artificially generating the crisis. Some saw it as a non-crisis and therefore made no changes in their behaviour. Adjustments in the use of the family car were made by 79% of the respondents. Considerable proportions of households cut back on the use of electricity and home heating. A small proportion (3.6%) was forced to leave their jobs because of the crisis. Upper-income families had more flexibility in responding to the crisis, notably to the price pressures. These families can contribute more to energy savings. There does not appear to be as much waste that can be eliminated by lower-income households. These households tend to carry a disproportionate burden, mainly in terms of loss of employment and erosion of purchasing power leading to lifestyle adjustments. Three main constraints must be taken into account in formulating energy conservation policies: economic productivity, the environment and equity.

6060

Phifer, Susan P., Alfred J. Neveu and David T. Hartgen
1979 Family Reactions to Energy Constraints.
Albany, N.Y.: State Department of Transportation.

Objective: To describe an attempt to assess the effects of various policies to curtail automobile fuel consumption

Method: A survey was employed which used an interactive game type of technique called REACT (Response to Energy and Activity Constraints on Travel). The sample consisted of eight two-car and four one-car families, selected by a "friends of friends" method. Families were asked to map out travel on the game board for typical weekdays and weekends. They were then presented with one of the policies (see variables) and asked to modify their travel behaviour from baseline as necessary.

Variables: Dependent: what travel was affected, the alternative mode used, how travel was affected.

Independent: policies (one no-drive day, 20% reduction in travel for both weekday and weekend), demographics

Findings/implications: Alternatives chosen to travel restrictions included trip chaining, decreased discretionary travel and some carpooling. In no instances did families choose to switch to public transit. There was some rollover to other days (for policies requiring no-drive days). The no-drive day for the two-car families did not decrease total miles travelled in three of the eight cases and, in one case, it actually increased total mileage. Restrictions imposed on a person's travel will affect his daily activity pattern and also that of in his family. Some segments of the population have more flexibility in dealing with these changes than do others. The REACT game appears to allow the collection of a rich and varied data source.

6065

Phillips, Nicolas and Elizabeth Elson

1976 Energy Savings in Private Households - An Integrated Research Programme.

Journal of The Market Research Society, Vol. 18, No. 4, October, 180-197.

Objective: To study the United Kingdom's energy conservation from 1974 to 1976

Method: A research program was carried out to study energy conservation in the United Kingdom from 1974 to 1976

Variables: Perceived price increases in energy in relation to other goods and services, plans to install energy saving devices

Findings/implications: Statements of intention may be more predictive of behaviour in household markets than is the case with other durable markets. Some general statements are made about the marketing of energy saving.

6070

Phillips, Peter

1976 Household Energy Consumption.
Auckland, New Zealand Energy Research And Development Committee,
University of Auckland, May. Report No. 10.

Objective: To summarize the results of a study of household attitudes towards energy use

Method: During 1975, seven batches of questionnaires were mailed to a random sample (N=17,500) of New Zealanders drawn from the 1974 Local Body Electoral Rolls. The response rate was just under 60%.

Variables: Attitudes of New Zealanders to the energy situation and to the need for conservation

Findings/implications: Considerable sympathy existed among respondents for the idea of energy conservation. The need for it was perceived to be high. The behavioural intention to conserve appeared to be well developed. Respondents particularly favoured legislation to require insulation of new homes, restrictions on car access to the centre of cities in order to encourage public transport use, and a progressive electricity tariff. Rationing was rejected by a 60-40 margin. The majority chose coal from the alternatives of coal, nuclear energy and oil as power generation sources in a situation in which the potential environmental impacts of each represented the major decision criterion. Respondents felt that first priority for oil, if the supply should become restricted, ought to be for farm vehicles -- not a surprising outcome in a nation heavily dependent on foreign earnings from agricultural exports. Railways and buses were ranked ahead of airlines in this regard, with private cars being ranked last of the six users. No relationship was found between individuals' knowledge of the energy sector and their attitude towards energy conservation. Respondents were reluctant to cut down on high consuming uses in the home and failed to consider that a very small proportionate reduction in the use of one of the high-consuming uses would have at least an equal impact to cutting right down on a small-intensity use. Suggestions for policy implementation are included which emphasize turning behavioural intentions into behaviour.

6075

Pilati, David A.

1976 Energy Savings via Behavioral Changes.
 Industrialization Forum, 7, 2-3, 103-106.

Objective: To determine potential energy savings from several behavioural changes, using a computer simulation

Method: Analysis is based on data for a home typical of early 1960's construction.

Variables: The effect of a behaviour change on energy savings with respect to temperature control settings; hourly weather for cities

Findings/implications: Theoretically, behavioural changes in the use of home space conditioning systems could reduce U.S. energy consumption by about 4.5% with little discomfort.

Pitts, Robert, and James Wittenbach

1979 Tax Credits As A Means of Influencing Consumer Behavior -- The Residential Energy Conservation Tax Credit 1978.

Working paper, College of Business Administration, University of Notre Dame.

Objectives: (1) to study the pros and cons of tax credits; (2) to examine the influence of tax credits on consumer behaviour; (3) to review the basic provisions of the energy tax credit and its expected impact on energy conservation; and (4) to report on the results of a study designed to measure the impact of the energy tax credit on consumers' decisions to insulate their homes

Method: A telephone survey of persons who had made insulation purchases was conducted in the spring of 1979 in a midwestern city. Two hundred respondents were prenotified by mail and 146 usable responses were obtained.

Variables: Dependent: amount of credit claimed

Independent: demographics, the importance of credit in the purchase decision, knowledge of the credit, acquisition of information regarding the credit, cost of insulation.

Findings/implications: Most of the purchases involved insulation (attic 86%, wall 33%, floor 13%). The average purchase was \$428, with a range of \$50 to \$2,000. Some (42%) said the credit was important or very important in making the purchase decision, but all said they would have made the purchase regardless. Energy cost was the most important factor in the purchase decision for most respondents (95%). Almost half (47%) did not learn about the credit until the time of or after the purchase (9% learned about it from the study). Many people did not understand the credit fully, and some did not take the credit because they just did not know enough about it. Families with incomes below \$10,000 received significantly lower credits than did those with incomes above \$10,000. There was no significant difference in the amount of the purchase between those who knew and those who did not know about the credit prior to the purchase. Those who did not take the credit (20 of 146) were generally older and less educated.

The tax credit has had a minimal effect on major insulation purchase decisions. The usefulness of the credit is largely determined by consumer knowledge of the subsidy which, in this case, was low. The credit may be too small or too far removed in time from the purchase date to be a factor in the purchase decision. Tax credits do not benefit lower-income families equally, because they do not have the funds to retrofit their homes or any tax liability. Direct expenditures may be required to help low-income families insulate

Pitts, Robert, and James Wittenbach (cont'd)

their homes. Consumers must be made more aware of the credit if it is to be effective. In general, more consumer-oriented research is required to guide policy makers.

6085

Pogany, D.Z. and J.E. Dunwoody

1976 The Potential Economic Impact of Solar Heated Residences in Illinois, 1976-2000.

Abstract: This study examines the economic viability of solar heating systems for new residential construction in Illinois and looks at the economic and conserving impact over the time frame, 1976 to 2000.

Public Response Associates Inc.

1978 : A Systemwide Attitude Survey. Volume One: The Management Summary Report.

Prepared for Southern California Edison Company.

Objectives: (1) to continue measurement of the effects that public events and Southern California Edison (SCE) programs have had on peoples' opinions and perceptions since earlier studies conducted in 1976 and 1977; and (2) to examine public attitudes so that SCE might develop programs reflecting customer needs and concerns

Method: In-home interviews (2,022) were conducted in June 1978.

Variables: Dependent: general attitudes toward the energy issue, belief in the energy crisis, expectations of future electricity needs, reported conservation behaviours, awareness and acceptance of solar energy, attitudes toward plans designed to deal with peak load demand, evaluation of SCE in various areas, attitudes toward electricity rates

Independent: demographics

Findings/implications: There was a significant increase in the proportion of people who perceived the energy situation as being serious (37% vs. 25% in 1977). Respondents generally have unrealistic expectations about the full-scale development of solar power to produce electricity -- more than 50% say this will occur in the next ten years. There is also some growth in the feeling that science can readily solve the energy crisis. People are now more willing to conserve, especially if they understand what is being asked of them and if they believe industrial and commercial users are doing their share. More people (61%) believe that residential users are doing a good deal to conserve than believe that industrial (44%) or commercial (39%) users are doing the same. More than one-fifth say that they could not cut back electricity usage whatsoever; 28% could cut back by one to five %, and 33% could cut back by more than six %. More people now say they would be willing to alter their consumption habits (in terms of peak load) if so asked by the government or a utility. Plans for altering electricity use in peak periods met with more favourable response than in past surveys: voluntary energy reduction (50% rated such a plan as excellent/good, vs. 37% in 1977); increased rates (31% vs. 18%); installation of automatic shut-off devices (37% vs. 11%). One-third feel that electricity is still a good value for its price and two-third say that the price is basically fair. SCE received higher ratings generally both on the reliability and the dependability of its service and on its conservation efforts.

Public Response Associates Inc. (cont'd)

There are three other volumes in this survey. Volume II presents detailed conservation and load management findings; Volume III contains data on general opinions and attitudes towards Southern California Edison; and Volume IV gives a detailed analysis of general attitudes towards SCE by division.

Quelch, John A.

1979 The Builder and Energy Conservation: A New Target for Public Policymakers.

In Jerry C. Olsen (ed.), Advances in Consumer Research, Vol. VII, Proceedings of the 10th Annual Conference of the Association for Consumer Research, San Francisco, Ca.

Objective: To analyze the information inputs and intervention options available to public policymakers interested in stimulating the purchase by builders of more energy efficient equipment

Method: The analysis is based on data collected by Quelch and Thirkell (see Abstract No. 6410). Specifically, the case of water heaters is analyzed.

Variables: Attitudes towards the availability of higher priced energy efficient water heaters; factors influencing the purchase of specific water heaters; attitudes toward policy interventions

Findings/implications: Energy consumption attributable to imposed choice (selection by builder) purchases as a percentage of that attributable to all purchases in 1978 is 60% for furnaces and space heating equipment, 32% for water heaters and 18% for major kitchen and laundry appliances. Builders ranked price as the most important factor in choosing a particular water heater (energy efficiency ranked sixth of seven factors). Most builders (85%) perceived little or no difference among heaters in terms of their energy efficiency. Policy intervention can rely on three types of leverage: (1) mandatory leverage: standards; (2) financial leverage: manipulating taxes, subsidies or prices; and (3) message leverage: attempting to motivate through information. The most preferred government actions included raising energy efficiency performance standards and providing tax credits for installing the more expensive energy efficient appliances. The use of financial incentives and disincentives to influence builders presents several problems. Policymakers can most effectively stimulate builders to purchase energy-efficient equipment by upgrading performance standards and insuring that they are met. This might be coupled with an information campaign directed at consumers which will indirectly influence builders' purchases.

6410

Quelch, John A., and Peter Thirkell

1979 Builders As Consumers: Their Role in Residential Sector Energy Conservation.

In R.A. Fazzolare and C.B. Smith (eds.), Changing Energy Use Futures, New York: Pergamon Press (Vol. 3, 1412-1419).

Objectives: (1) to assess the knowledge, attitudes and behaviour of builders relating to energy conservation; and (2) to analyze the decision-making processes used by builders when purchasing energy using equipment for installation in new housing

Method: A questionnaire was mailed to 3,430 Canadian builders in March 1979. A total of 475 usable responses were obtained.

Variables: Dependent: importance rankings of factors influencing purchases of equipment for new residences

Independent: knowledge regarding residential sector consumptions and potential energy savings resulting from a number of actions; personal attitudes and household behaviour related to energy consumption; selection of equipment by different groups

Findings/implications: Builders overestimated the contribution of the residential sector to total energy consumption and seriously underestimated the energy used by furnaces and heating equipment. They also significantly underestimated the achievable levels of energy savings of a number of actions which might be taken around the home. Larger builders were more knowledgeable than small builders. Actions taken by fewer respondents were those involving the heavier financial commitments. Price and reliability were consistently viewed as the two most important factors influencing purchases of equipment for new residences. Energy efficiency was of relatively little importance. Policymakers may have to intervene to change this decision-making process by implementing financial (dis)incentives or changing product standards.

Quelch, John A., and Peter Thirkell

1979 "Imposed Choice" Purchases of Energy-Using Equipment in the Residential Sector: A Review.

London, Ontario: The University of Western Ontario.

Abstract: This review is designed to: consider decision-making processes used by individual consumers and intermediaries; estimate potential savings which could be achieved by applying energy consumption criteria to imposed choice purchase (excluding insulation) decision; and summarize policy options regarding imposed choice purchases. "Imposed choice purchase decisions" are so termed because the choice available to the ultimate consumer is circumscribed by the decision made by an intermediary (builder or landlord). Studies on appliance purchases have not found price to be a highly ranked purchase criterion (reliability and durability are). Intermediaries have different concerns, depending on whether the equipment is to be installed in rental accommodation or in accommodation for sale. Energy usage costs are unlikely to figure as purchase criterion for intermediaries. In most cases, there is little incentive to consider such costs as they are passed on to ultimate consumers and are claimed as tax writeoffs. The decision-making process involves owners, developers, architects and contractors, and two decisions: what to pre-install and which brand to buy. There is a trend towards more installation of kitchen appliances by intermediaries. In 1975, 68% of energy used in the residential sector was consumed by space heating equipment and a further 18% by water heaters. Using these figures, estimates of 1980 sales of equipment and decreases in energy usage based on improvement targets suggested by United States Federal Energy Administration (FEA) -- see Hirst and Carney -- it is estimated that energy savings could amount to one % of annual residential consumption. As the percentage of appliances conforming to the new standards increases, so will the energy savings. Policy interventions aimed at intermediaries might include setting standards for product design and/or maintenance, incentives or rebates to install energy-efficient equipment, and government and/or trade association information programs. Since the impact of one intermediary's behaviour has much greater impact than one ultimate consumer, greater effort should be made to affect their behaviour.

Reizenstein, Richard C., et al.

1975 Willingness to Pay for Control of Pollution: A Demographic Analysis.

In R. Curran (ed.) 1974 American Marketing Association Combined Proceedings, Series 36, Ann Arbor, 323-328.

Objectives: To identify: (1) the respondent's degree of awareness and willingness to pay for control of air pollution; (2) the demographic characteristics which would be most effective as a set in classifying an individual as willing to pay; and (3) the relationship between awareness and willingness to pay

Method: A survey of 376 families, randomly selected in a medium-sized southeastern city, was conducted.

Variables: Dependent: willingness to pay

Independent: length of residence, own/rent, sex, age, marital status, family size, employment, education, occupation

Findings/implications: Generally, respondents were in favour of paying for the control of pollution (60%) and, more specifically, 65% were supported paying for control of air pollution and 65% for control of water pollution. Those in favour of paying for the control of pollution were male, young, more educated and had a high income and occupational attainment level. Nearly three-quarters of the sample had either a fair or a good level of understanding concerning recycling and the control of pollution. The major implications are: (1) the majority of the sample is willing to pay for the control of pollution; (2) there is a definite demographic background to those who are willing to pay; (3) education and information programs should be designed to attract the old, less educated, poorer and female segments of the population; and (4) the next level of research should determine the national implications and the reasons why there is a lack of awareness.

6810

Reizenstein, Richard C., and David J. Burnaby

1976 An Analysis of Selected Consumer Energy-Environment Trade-Off Segments.

1976 Educators Proceedings (Series 39) of the American Marketing Association, 522-526.

Objective: To define the attitudinal and demographic characteristics of a consumers preferring various tradeoffs between gasoline and air pollution and home heat and air pollution

Method: In February 1974, at the peak of the Arab oil embargo, a questionnaire was mailed to 2,500 residents of three medium-sized (100,000-350,000 population) southeastern American cities; of these, 922 were returned in usable form. Data were analyzed by multiple discriminant analysis.

Variables: Dependent: three categories of gasoline/air pollution tradeoff preferences and two categories of heat/air pollution tradeoff preferences

Independent: 15 demographic variables, 11 media and interpersonal information sources, two measures of willingness to pay to reduce air pollution

Findings/implications: The major factor that seems to indentify the energy conscious consumer (for both gasoline and heat) is exposure to media and personal information sources. Other variables such as income are also effective discriminators but cannot be manipulated as can exposure to media.

The following tables help to identify the energy conscious consumer:

Table 1

A Descriptive Profile of Home Heat Preference Groups

<u>Group 1</u> Prefer less heat	<u>Group 2</u> Prefer same amount of heat
- smaller group	- larger group
- less than one family member 15 to 19 years of age	- less than one family member 15 to 19 years of age
- more than two paid family members	- less than two paid family members
- one to three years of college	- high school graduates, some have one to three years college
- higher income (approximately \$15,000 per year)	- income not as high (\$10,000 to \$15,000 per year)
- greater use of media and personal information sources	- less use of media and personal information sources
- greater willingness to pay to reduce air pollution	- less willingness to pay to reduce air pollution

Reizenstein, Richard C., and David J. Burnaby (cont'd)

Table 2
A Descriptive Profile of Three Gasoline
Consumer Preference Groups

<u>Group 1</u> Prefer more gasoline	<u>Group 2</u> Prefer less gasoline	<u>Group 3</u> Prefer same amount of gasoline
<ul style="list-style-type: none">- smaller group- highest income (in excess of \$15,000 per year)- use newspapers, radio, magazines least as information sources- use civic clubs and spouse least as information sources- least willing to pay to reduce air pollution	<ul style="list-style-type: none">- intermediate-sized group- middle income (\$10,000 to \$15,000 per year)- use newspaper, radio, magazines most as information sources- use civic clubs and spouse most as information sources- most willing to pay to reduce air pollution	<ul style="list-style-type: none">- largest group- middle income (\$10,000 to \$15,000 per year)- moderate use of newspapers, radio, magazines as information sources- moderate use of civic clubs and spouse as information sources- somewhat willing to pay to reduce air pollution

6815

Reizenstein, Richard C. and David J. Burnaby

1976 The Consumer and the Energy Shortage: A Post-Embargo Assessment.
1976 Proceedings of the Association for Consumer Research, Volume
4, 308-314.

Objective: To assess consumers' attitudes on a variety of energy-related items

Method: In February 1974, at the peak of the Arab oil embargo, a questionnaire was mailed to 2,500 residents of three medium-sized (100,000 to 350,000 population) southeastern U.S. cities; of these, 922 were returned in usable form. Data were analyzed by multiple discriminant analysis. A second mail survey, using the respondents of the February 1974 study, was conducted in October 1974; 382 of the original 922 returned the second questionnaire.

Variables: Dependent: perceived importance of national issues, attitudes towards selected dimensions of energy and air pollution, as well as reported and projected behaviour in the form of home thermostat setting and weekly gasoline consumption

Findings/implications: (1) Pollution problems were seen as less important than the energy issue in both studies. (2) Both studies indicate that consumers believe business in general to be more responsive to the energy situation than government. (3) An increased percentage of people recognized the energy situation as a real problem in the second study as compared with the first. (4) The respondents reported an overall slight downward shift in gasoline consumption between February and October 1974. (5) However, respondents indicated a slight increase in home heat thermostat settings for the same period.

Reizenstein, Richard, and David Barnaby

1978 Energy Related Attitudes and Automobile Size: Segmenting the Consumer Market.

Paper presented at American Marketing Association 1978 Marketing Educators' Conference: Chicago, Illinois.

Objective: To define the attitudinal and demographic characteristics of consumers owning various size categories of automobiles

Method: Surveys were mailed to 922 residents of three southeastern cities; 390 were returned in usable form.

Variables: Dependent: reported automobile ownership by size and number of vehicles

Independent: media and personal information source utilization; demographic descriptors; energy and pollution related attitude and activity measures (45). These 45 variables later decreased to 15 in three groups: those factors focusing on threatening aspects of the energy crisis and their paramount importance contrasted to other issues such as pollution; those focusing on corporate public relations' reaction to the energy crisis; and those focusing on the interrelationship of the energy crisis and various transportation activities.

A multiple discriminant analysis was performed using four groups for classification purposes: full size (N=115); intermediate (N=184); compact (N=52); and subcompact (N=28). Multiple car families were assigned to the category equivalent to the smallest car.

Findings/implications: Of the information source variables, information from spouse and information from relatives were the only significant discriminators (they had most impact within the subcompact group). Media information sources were important in all groups. Two demographic variables had the greatest impact on understanding group differences: income and number of children aged 15 to 19 (highest within the subcompact group -- probably meaning it is their second car). Only two of 15 attitude measures were significant discriminators: "the 55 mph speed limit has significantly contributed to gasoline conservation" (the subcompact group agreed most, the intermediate least); and "petroleum should be conserved by carpooling and diverted for home heating" (the subcompact group agreed least, the intermediate most). The ability to build a group profile was not as great as authors would have desired.

6825

Reizenstein, Richard, and David Barnaby

1978 Assessing the Potential Effects of Differential Price Increases
On Gasoline Usage.

Knoxville, Tennessee: University of Tennessee.

Objective: To assess the possible impact of incremental advances in the price of gasoline on consumer usage

Method: Questionnaires were distributed to 2,500 residents in three southeastern cities in February 1974. 922 usable responses were obtained and 390 were received in a followup study done in October, 1974.

Variables: Dependent: measures of intentions regarding gasoline usage for hypothetical price increases (ranging from \$.05 to \$.45 per gallon)

Independent: information source variables, energy related attitude and activity measures, demographic characteristics

Multiple discriminant analysis was done to describe segments in terms of their energy-related attitudes, use of information sources and selected demographic characteristics.

Findings/implications: Increases of \$.15 gallon resulted in 35% of sample saying they would reduce consumption by one to six gallons a week, 9% by seven to twelve gallons a week, with 56% remaining price inelastic. For an increase of \$.45 gallon, the figures were 18%, 30% and 52% respectively.

Discriminant analysis of three segments (no reduction, reduction of one to six gallons/week, reduction of seven to twelve gallons/week) at an increase of \$.10/gallon yielded six significant variables: information received by mail (group 3 was the highest), number of cars owned (group 1 was the highest), "the energy shortage will hurt our economy" (group 3 was the highest), "fuel alternatives to gasoline will power future automobiles" (group 1 was the highest), "energy problems are more important than pollution abatement" (group 1 and 2 were higher), radio (group 3 was the highest). At an increase of \$.30/gallon the analysis yielded seven significant variables: age (group 1 was older), education (group 2 had the highest level), "energy crisis will create personal hardship for our citizens" (group 1 was the highest), "newer auto engines are highly fuel efficient" (group 3 was the highest), "energy crisis created by oil companies" (group 1 was the highest), number of children 0 to 5 years (group 3 was the highest), mobility (group 3 was thus highest). Analysis thus yielded a distinct demographic profile of the three groups.

Reizentein, Richard and David Barnaby (cont'd)

Analyses supported the division of respondents into 2 groups those who were basically price inelastic (at highest increase they are still in majority) and those who possessed varying degrees of price inelasticity.

The price mechanism, which depends on voluntary consumer response, may be an ineffective alternative because of the large price in elastic group. Mandatory compliance measures may be required. Promotion could affect those conservation-oriented segments.

Riecken, Glen, Yavas, Ugur, and Venkatakrishna V. Bellur
1978 Energy Conservation Knowledge and Behavior of Homeowners Versus
Renters: A Comparative Study.
Institute for Decision Sciences, St. Louis, October.

Objectives: (1) to compare the level of knowledge of homeowners vs. renters concerning energy conservation measures; (2) to compare the energy conservation ethics of homeowners vs. renters; and (3) to determine if the behaviour of homeowners vs. renters differs regarding the purchase of energy-conserving products for their residence

Method: Personal in-home interviews were conducted in east-central Indiana during January 1978. Usable responses were obtained from 130 renters and 250 owners.

Variables: Dependent: owner/renter

Independent: level of knowledge about energy conserving measures and their effectiveness; energy-conserving steps taken

Findings/implications: There was no significant difference between owners' and renters' level of knowledge about energy-conservation measures and their effectiveness. The two groups were also similar in terms of their energy-conserving ethics behaviour. Owners did engage in significantly more energy-saving actions that required monetary expenditure. The owner/renter variable may be the causal variable leading to such behaviour. Tax savings for homeowners are appropriate incentives to induce such behaviour.

Riecken, Glen, and Venkatakrishna V. Bellur

1978 Gasoline Consumption: What Affects It and Can It Be Curbed?
Presented at the Eighth Annual Meeting of the Southeastern American Institute for Decision Sciences, Jacksonville, Florida: February.

Objective: To investigate: (1) whether increased gasoline prices would decrease the demand for gasoline by a significant amount; (2) whether gasoline demand fluctuates with income; and (3) whether price and income are the major explanatory variables of the amount of gasoline used

Method: Primary data were collected from gasoline consumers in two Indiana communities Secondary data was gathered to indicate annual disposable income, annual yearly price of gasoline and per capita consumption of gasoline (for the past 29 years).

Variables: Dependent: gasoline consumption

Independent: price, income

Price and income were related to consumption by a Cobb-Douglas model. Multiple regression was used to analyze the data.

Findings/implications: The results appear to imply that the demand for gasoline is both price and income inelastic. It was expected that the demand would be price inelastic, but it was predicted that demand would be income elastic. Only 14% of the variance in the demand for gasoline was explained by the two independent variables. Research might explore the difference between essential and non-essential consumption and the effects of alternative modes of transportation on consumption. It would appear that, in terms of public policy, increasing gasoline prices would not have a material effect on gasoline consumption. More research should be conducted before any firm conclusions regarding the relationship between income and gasoline demand can be reached.

Riecken, Glen, and Ugur Yavas

1979 Energy Conservation Awareness.

Ball State Business Review, 9, 2 (Fall), 2-5.

Objective: To determine Muncie, Indiana residents': (1) level of awareness and knowledge concerning energy-conservation measures related to heating and cooling a house and running appliances; (2) energy conservation ethics; and (3) behaviour regarding the purchase of energy-conserving products for their residences

Method: Five hundred residents were contacted and 385 usable personal in-home interviews were completed.

Variables: Independent: demographics, awareness and knowledge concerning energy use, energy conservation ethics, reported purchase of home-use energy conserving products

Findings/implications: Respondents had moderate to high levels of awareness and knowledge regarding energy consumption and conservation techniques. They were more likely to engage in easier ethics-oriented behaviour, such as lowering thermostats and turning off unneeded lights, than in behaviour which involved personal expenditure. Research should investigate the relationship between energy conservation ethics and the individual's expected resultant discomfort.

6845

Riegel, K.W., and S.E. Salomon

1974 Getting Individual Customers Involved in Energy Consumption.
Public Utilities Fortnightly, 94, 10, 29-32.

Objective: To study the effects of limited feedback on residential electricity consumption

Method: The Atlantic City Electric Company of New Jersey included a statement (March 8, 1974) on each residential monthly bill, telling how much more or less electricity was used in the current month as compared to the same month last year. (For this, Atlantic City Electric received the first Federal Energy Administration (FEA) energy conservation award in August 1974). The new billing was sent to 180,000 residential customers without direct prior notification. During the first billing, cycle, 800 inquiries, were received mostly by telephone (about 5 percent of the bills sent out and more than double the normal number of inquiries). Any design in this crude experiment is probably accidental.

Variables: The reduction of residential electricity consumption pursuant to information feedback via billing and in conjunction with other company conservation measures

Findings/implications: Atlantic City experienced a 2.6% gain in April, less than the national average of 3.4%, but in May, with the program fully implemented, residential sales dropped 4.6% below the previous year's level (the national figure rising over 3%). The reduction is in part attributed to price increases. About two-thirds of the customers were surveyed in March 1974 by the company's Marketing Research Department. Respondents stated either that they were conserving as much as possible (by reducing heating, cooling or use of lights) or that they were concerned and intended to conserve energy.

Roberts, M.C.

1977 Energy Management: The Human Aspects of Energy Conservation.
 Rugby, England: Institute of Chemical Engineers.

Abstract: The human aspects of energy conservation are discussed and the concept is expanded that the correct attitudes and motivational forces are highly significant towards achieving substantial conservation for minimum cost. Energy should be treated just as any other human or material resource. The fact that it cannot be seen is no reason for management to overlook their responsibilities to control and adequately supervise its usage, as frequently happens. All too often, the responsibility for energy costs is that of the chief engineer, who usually produces it efficiently, only to see it used less so. Examples are given of the scope achieved through application of a dynamic and positive energy management program.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

6855

Rodosky, Robert James

1978 Parental and Student Attitudes, Activities and Perceptions of A School Instructional Program During An Energy Crisis.
Unpublished Ph.D. dissertation, Ohio State University.

Objective: To determine student and parent group attitudes, actions during and perceptions about an emergency instructional program

Method: The program was conducted in Columbus, Ohio during February 1977. It consisted of instruction in school and through the mass media, and voluntary efforts. A survey was administered to 784 students and mailed to 300 parents (88 responded).

Variables: Dependent: involvement in program activities, attitudes toward the program, perceptions of others' involvement in the program

Independent: group (minority vs. non-minority, affluent vs. poor, male vs. female)

Findings/implications: Minority, poor and female students participated in more program activities than their counterparts. Attitudes and perceptions about the program did not differ significantly between groups. Poor parents perceived their children participating in more program activities. The program as a whole met with limited success. Older students tended to take part in fewer activities. Instruction through volunteer efforts was more effective than mass media efforts. A school system should develop an alternative program of instructions to be implemented if the energy crisis forces closure of the school activities.

6860

Root, Trent Jr.

1978 Energy and Utilities: A Detailed Look at More Than 100 Public
 Opinion Polls.

 Electric Perspectives, 3, 1-8.

Abstract: The Group Attitudes Co., the research survey division of Hill and Knowton Inc., analyzed information from 101 individual public opinion studies dealing with energy. Public views on causes of the energy crisis, public commitment to energy conservation (it is lacking), an insistence that all options be explored and frustration mounting over governmental inaction are summarized. Elite audiences have been quicker than the public at large to recognize the urgency of the energy shortage. Consumer reaction to higher rates is turning a favourable image of electric utilities sour.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Rosa, Eugene

1978 The Public and the Energy Problem.
 Bulletin of the Atomic Scientists, 34 (April), 5-7.

Objective: To examine the extent to which the American public actually believes that an energy problem exists

Method: Data was obtained from 17 national surveys conducted between 1973 and 1977 by the Gallup Organization.

Variables: The polls asked the question: "What is the most important problem facing this country today?"

Findings/implications: Americans have expressed a consistent but low level of concern about energy since early 1973. This concern about energy has generally been overshadowed by concern about inflation, unemployment and dissatisfaction or lack of trust in government. Only at one point, during the oil embargo of 1973-74, did energy outrank other concerns as the most important problem. It may be that this relatively low level of concern has been brought about because Americans receive mixed messages about the seriousness of the problem. Policy makers cannot expect measures calling for voluntary or mandatory action to be effective unless the public believes that the problem is serious. This points to the need for a well-planned, thorough educational program to provide reliable information about the energy problem.

6870

Ross, Richard

1974 Environment, Energy, and Transportation: The Riddle of Responsive Public Policy.
Chicago: Market Facts, Inc.

Objective: To examine the public's preferences for different policy alternatives regarding energy

Method: The findings of three studies done by Market Facts in this areas are examined.

Variables: The three studies are based on tradeoff analysis. Respondents are presented with a 3 x 3 matrix representing a tradeoff between two issues (e.g. gasoline prices vs. gasoline usage) and are asked to indicate their relative preference for the nine alternatives. The studies included examined improvements in public transit, energy policy alternatives and choices of energy futures.

Findings/implications: Public transit Ridership on the major transit system studied would increase if the following attributes were modified: personal security, improved to perfectly safe (increase 93%); comfort, improved to very comfortable (43%); number of transfers, decreased to 0.7 (19%); distance to bus stop, down to two blocks (15%); trip time, reduced by 20% (14.6%); seat availability, so some seats are available (13%); fare, reduced \$.15 to \$.45 (8%); waiting time, cut to nine minutes (6%).

Energy policy alternatives Faced with four policies (limiting heating oil availability, limiting gasoline availability, putting up with more air pollution, and increasing gasoline prices), the public cared about all of them and did not wish to face any of the four.

Energy futures Respondents were first asked to choose between Future A, all-out energy production (much higher energy prices, 100% availability, no auto restrictions, high air pollution), and Future B, all-out energy use restriction (no increase in prices, rationing of supplies, auto usage taxes and travel restrictions). Future A was preferred by 77% of respondents. Modifying the two extreme futures so they were more similar resulted in the modified Future B being selected by 64% of respondents.

Tradeoff analysis can provide policy makers with an effective way of evaluating the public's response to a large number of options. There appears to be a fairly wide spectrum of actions which the public would find acceptable.

6875

Rosson, Phillip J., and Robert W. Sweitzer

1979 Demographic and Lifestyle Correlates of Inefficiency in Home Heating Oil Consumption.

Halifax, Nova Scotia: Dalhousie University.

Objective: To examine the associations between heating oil and five physical housing factors and various demographic and lifestyle characteristics of the households

Method: A survey was performed of 360 non-farm households in Halifax and Dartmouth, Nova Scotia. Householders must have lived a year at the current address, be responsible for own energy bills, carry out no commercial activities within the residence and the household must not be all-electric or a trailer.

Variables: Physical housing factors (all controllable by residents): difference between the temperature maintained inside house and that outside; wall, window and door heat losses; ceiling and roof heat losses; infiltration heat losses (cold air seeping into house); efficiency of furnace

Demographic: parents' average age; parents' average education level; family healthiness; family size; parents' income

Lifestyle: defined through the use of 70 activity, interest and opinion (AIO) statements using 22 variables (e.g., entertainers, energy conservers, spenders, optimists, moralists, warmth seekers)

Behavioural: level of home conservation knowledge; extent to which the family prepared to move for job advancement; feelings about the Canadian government's, world leaders' and oil companies' responsibility for the energy crisis.

Findings/implications: The Pearson correlation coefficients for aggregate heating oil consumption and the five physical housing factors were: average temperature (.18), wall heat loss (.47), ceiling heat loss (.33), infiltration heat loss (.41) and furnace efficiency (.00).

High thermostat settings are associated with households with older parents, that are less healthy, that do not believe in the energy crisis and households of smaller size, (among others). High wall heat and high infiltration heat losses are associated with households where parents have more years of formal schooling, believe more in an energy crisis, have higher total incomes and are less involved in "do-it-yourself" activities, (among others). High ceiling heat

Rosson, Phillip J., and Robert W. Sweitzer (cont'd)

losses are associated with households of smaller size that heat their cottages through the winter and the factors mentioned above under wall heat loss, (among others). Inefficient furnaces are associated with households that are less concerned with energy saving in the house, that are more healthy and that are less optimistic regarding the technical solutions to the energy situation.

Most salient of the demographic variables across the five factors were health, family size and age. Of the lifestyle variables, they were "do-it-yourselfers", warmth seekers, optimists, helping husbands and energy crisis non-believers.

It may be possible to build a profile of inefficient areas of heating oil and to devise conservation programs specifically for them. Specific programs (e.g., regarding furnace efficiency) can be aimed at groups with particular demographic and lifestyle characteristics.

Rosson, Philip J., and Robert Sweitzer

1979 The Physical and Behavioural Factors Affecting Household Heating Oil Base.

Halifax, Nova Scotia: Dalhousie University.

Objective: To locate and characterize excessive users of heating oil, where excessiveness is defined as usage above the norm for the house given its physical nature

Method: A sample of 360 was surveyed in the spring of 1977 in the Halifax-Dartmouth area. To be included in the sample, a household had to be responsible for its own energy bills, not be all-electric, not be a trailer and have one year's residence at the address.

Variables: Dependent: average annual fuel consumption

Independent: demographic (age, income/education, marital status, health, family size); behavioural (level of home conservation knowledge, extent to which family was prepared to move for job advancement, and three responsibilities measures -- Canadian government's, world leaders', and oil companies' responsible for energy crisis); lifestyle (22 variables, e.g., warmth seekers, cash shoppers, optimists, crisis nonbelievers); physical (temperature difference, inside vs. outside, wall and glass transmission loss, ceiling transmission loss, air infiltration heat loss, efficiency of furnace).

Regression analysis was performed in two stages: all variables against aggregate oil consumption; demographic and lifestyle variables against excessiveness in oil consumption.

Findings/implications: Significant variables of the regression of all variables against aggregate oil consumption were: physical -- heat loss and temperature difference; demographic -- income; lifestyle -- federal policy critic, heat sensitive, budgeters, self-doubters (R^2 - .31). Significant variables of regression of excessiveness in oil consumption were all lifestyle variables (R^2 - .12). "Excessive" consumers prefer cash shopping, believe that science will solve the energy crisis, adopt new products, have somewhat traditional family roles and show more willingness to relocate for job advancement. "Conserving" consumers (those below norm suggested by their homes physical characteristics) lack self-confidence, feel they can save energy and make a practice of doing so and are family centered. "Excessive" consumption families tend to be older, smaller, less well educated and have higher income. Household energy use may be more complicated than is suggested by this study. Physical and behavioural factors are probably interrelated and future research should study this relationship.

Ruffin, Marilyn Doss

1978 Consumer Appliance Decisions: Using Energy Labels.
Family Economics Review (Summer), 10-13.

Abstract: This paper attempts to answer some of the questions that consumers are likely to have when the new energy labels begin to appear in the marketplace. The cost of energy to operate an appliance can amount to a substantial portion of the appliance's "life-cycle cost" (LCC). Consumers can use a simplified LCC formula, taking into account only energy costs and purchase price when purchasing appliances. A seven-step illustration of the use of the life cycle concept for a consumer is presented.

6890

Russo, J. Edward

1977 A Proposal to Increase Energy Conservation Through Provision of Consumption and Cost Information to Consumers.
American Marketing Association Proceedings, Series No. 41, 437-442.

Objective: To test the effects of feedback on residential electricity consumption

Method: A field experiment was conducted analyzing the residential energy users of five American utility companies.

Variables: Dependent: consumption of energy

Independent: feedback about the success of the individual's attempts to conserve energy printed on monthly energy bills

Findings/implications: A 2 to 3% reduction in energy use was obtained as a result of the feedback of information. Customers were angered by increased rates because the feedback information showed them that they were using less energy but paying higher energy bills. When the energy message was terminated some of its beneficial effects were lost fairly quickly.

6895

Rycroft, Robert W.

1975 Energy Policy Feedback: Bureaucratic Responsiveness in the Federal Energy Administration.
Policy Analysis, Vol. 5, 1-19.

Objective: To examine and evaluate the responsiveness of the Federal Energy Administration (FEA) to public interest and opinion during the period from 1973 to 1975

Method: A descriptive review of the reactions or responses of the FEA to public opinion polls during 1973 to 1975. Responsiveness was defined in terms of the correspondence between agency decisions and public opinion, or in terms of how the two suit each other. Data for public opinion are based on national surveys done by Gallup, Harris and the Opinion Research Corporation.

Variables: Dependent: the decisions of the FEA

Independent: public opinion concerning awareness; oil pricing; oil imports; corporate profits; fuel allocation

Findings/implications: Generally, the public was unaware that the federal government had a special agency to deal with energy; only 6% knew the name of that agency. However, when oil pricing was examined, public attitudes towards control of the industry were reflected in policy. By the middle of 1974, the government introduced decontrol policies which were generally opposed by the public. The public attitude changed by the middle of 1975 in favour of the government's policies if de-control would prevent rationing. The government's behaviour in the area of oil imports reflected public opinion fully. The public generally supported the reduction of imports and the regulation of certain segments of the oil industry, as well as regulation of corporate profits. Rather than fully reflecting public opinion in this area, the government made small advances towards regulation of the industry and the sector. During 1974, the public favoured government regulation of allocation slightly which, in turn, reflected the various levels of impact upon the different regions. The governmental action that followed in 1975 was aimed at easing the regional impacts and reflected public opinion to a large extent.

In short, governmental behaviour and actions tended to correspond to public opinion and public preferences for the allocation of resources, the regulation of prices in the long term and the regulation of oil imports. The regulation of oil prices tends to indicate that the public was manipulated into accepting governmental policy but there is no study to determine its validity. As such, the government tends to incorporate public opinion into its decision-making and public opinion is a valuable tool in decision-making.

Scardino, Vincent A., Birch, James C., and Kathy Vitale
1976 Impact of the FEA/EPA Economy Information Program
Volume II: Report of the Study.
Prepared by ABT Associates for the Federal Energy Administration.

Objectives: To determine: (1) the level of awareness of the 1976 gas mileage label; (2) the level of awareness of the 1976 Gas Mileage Guide for New Car Buyers; (3) the relationship between awareness of the label/guide and buyers' attitudes; and (4) the relative importance of fuel economy in new car purchase decisions

Method: Data were collected through a national telephone survey of registered owners of 1976 model vehicles. A total of 796 interviews were completed. The sample was stratified by state, vehicle type and month of registration.

Variables: Make and model of the vehicle purchased; reasons for purchase of the particular vehicle; reasons why the respondent purchased a model rather than other vehicles he may have considered; attitudinal ratings of the importance of various vehicle characteristics that entered into the purchase decision; questions concerning mileage economy of the new vehicle as well as of any previous vehicle respondent may have replaced with the new vehicle; car usage characteristics; gasoline buying habits; awareness of and attitudes towards fuel efficiency label; awareness of and attitudes towards the 1976 Gas Mileage Guide for New Car Buyers; demographic information -- age, education, household size, income

Findings/implications: Many buyers (72%) were aware of the program's existence, but only 53% actually saw the label on the car they purchased, and only 7% used the guide. Over half (56%) of respondents rated good fuel economy as an "extremely important" factor in making their purchase decision (it was ranked seventh). Good fuel economy was ranked by 16% as the single most important factor in their decision. Fuel economy was more often named as the number one factor by the "aware" buyers, and was more important to lower- and middle-income groups, females, smaller families and people living in the west and northeast. Members of the "aware" group were slightly younger, of higher income, somewhat better educated and more likely to own a smaller car. The differences between aware and unaware groups were not large. Aware buyers were more likely to replace their older cars with ones which had better gas mileage; their new cars had 20.4% better mileage than their old cars, while the unaware group increased their mileage only 0.7%. Of those aware of the label, 64% did not believe the EPA estimate. However, actual mileage reported by buyers was only about one mpg below the estimate. To increase the credibility of the label, consumers should be provided with more information about the reasons why they might expect some variation in the car's

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mileage vs. the EPA estimate. Information about expected mileage under different driving conditions could be provided (rather than simply highways vs. city). Changes are recommended in the format of the guide and label and in the content and distribution of the guide.

7210

Schipper, Lee, and A.J. Lichtenberg

1976 Efficient Energy Use and Well-Being: The Swedish Example.
Berkeley: University of California, Lawrence Berkeley Laboratory, Report 4430. Reported under the same title in Science, 194, 4269 (December 3), 1001-1013.

Objective: To make a detailed comparison of per capita energy consumption between the United States and Sweden

Method: Analysis is based largely on 1970-72 data from statistical abstracts and various other sources.

Variables: The United States vs. Sweden in connection with basic economic and social indicators; energy use related to transportation, residences and commerce; industry; imports and exports

Findings/implications: Sweden used 55 to 65% of the per capita energy (with the counting of hydroelectric energy being problematic) at essentially the same per capita income as the United States. The difference arose from differences in both the mix of economic activities and in the energy consumption per unit output in these activities. Sweden had higher efficiencies in transportation, materials processing and space heating. Heavy use of automobiles in the United States was a major factor here. The study suggests that institutional and social factors determine how close individual consumers, firms, and society as a whole come to the most economic use of energy. For example, in the United States mortgage policies and market considerations constrain developers to minimize first costs, rather than life cycle costs, in contrast to Sweden.

Shipper, Lee

1979 Another Look at Energy Conservation.
 American Economic Review, 69, 2 (May), 362-368.

Abstract: Conservation is a continuous process and will not necessarily come at the expense of decreased productivity. Energy can be saved in the industrial sector through retrofitting and the modernization of processes and equipment. Savings will be dramatic in the building sector; modifications can lead to attractive returns in terms of energy savings. In the transportation sector, increasing the efficiency of auto fleets can lead to savings, as can changes in trucks and airplanes. Lowered energy prices, below replacement levels, induce overconsumption of energy relative to other resources. Prices should represent the full social costs of producing and using energy. Careful consideration and use of the potential of energy conservation will greatly enhance the energy supply.

Schnaiberg, Allan

1975 Social Syntheses of the Societal-Environmental Dialectic: The Role of Distributional Impacts. Social Science Quarterly, Vol. 56, 1 (June), 5-20.

Objective: To explore the structural relationships between societal organization and the physical environment using a dialectic model to elucidate the role of social conflicts around environmental issues

Method: The report summarizes existing empirical research on the distributional consequences of the energy crisis.

Variables: Effects of the energy crisis on consumption, employment, income and profits

Findings/implications: The energy crisis (as a simulation of "planned scarcity") had net regressive distributional impacts. For example, the poor suffered more than the well to do in terms of income loss, unemployment and impact on lifestyle. Small businesses were hurt more than large corporations. The Nixon administration was able to use the energy crisis to justify curtailing "non-essential" federal governmental expenditures such as health, education and welfare.

The implications of the study are that the distributional impact of the energy crisis was regressive towards the poorer segments of the population. The government must be aware of and attempt to reduce such effects to achieve a more equitable distribution towards the social-economic attributes as well as businesses.

7225

Schneider, Alan M.

1975 Elasticity of Demand for Gasoline.
Energy Systems and Policy, 1, 3, 277-286.

Objective: To measure the elasticity of the demand for gasoline

Method: A study of gasoline sales was conducted in California in order to measure elasticity of demand. A time-series analysis was used in conjunction with data from thirteen plus years (1960 to 1972). Data for sales were taken from the State Board of Equalization and from reported sales for regular grade from 4,000 major brand retail stations in Los Angeles. An average figure for price was arrived at using the latter.

Variables: Price per gallon and monthly sales of gasoline in the Los Angeles area

Findings/implications: A 17% increase in the price of gasoline in the Los Angeles area produced no observable change in gasoline consumption for the time period analyzed. Gasoline prices were thus found to be inelastic to demand.

Schneider, Mary Lynn

1979 California Residential Load Cycling Attitude Survey.
Sacramento, Ca.: California Energy Commission.

Objective: To collect information on the attitudes of consumers who had participated in the central air conditioner cycling (load management) program

Method: The experiments were structured specifically to determine consumer acceptance. Over 1,700 participants in four utility service areas were exposed to a mix of three types of equipment and four cycling strategies. In three of the four areas, consumers were interviewed pre-and post-test, while in the other no post-test interview was conducted.

Variables: Dependent: responses to attitude questions

Independent: generally, two cycle strategies were used -- a long cycle (13 minutes off/half-hour) and a short cycle (seven minutes off/half-hour); demographics.

Findings/implications: There were no discernible differences among the participant, control and nonparticipant groups in terms of their demographic characteristics. Those subjected to the long-cycle strategies were less likely to be satisfied with the experiment or willing to participate a second year. Discomfort and inconvenience were the most common reasons. Education and income were significantly related to comfort after cycling and satisfaction with the program. As the education level increased, the dependence or importance of the financial incentive (vs. the intrinsic) decreased. Only 59% of respondents felt that the program should be mandatory for all customers.

The results indicate that central air conditioner cycling is acceptable to Californians who have experienced it. However, a number of questions remain unanswered and should be investigated further: (1) What specifically caused the change in pre-test/post-test thermostat settings? (2) What influences (financial reward, feedback of information, social commendation or mass media appeal) are most important in motivating consumers to participate in such an experiment? (3) What is the effect of the number of cycling days on customers' attitudes, especially concerning comfort?

7235

Schnidman, Frank

1977 Awareness and Perception of the States to Local and Regional Needs Created by Energy Production or Extraction Facilities. Prepared for the U.S. Department of Housing and Urban Development by the Urban Land Institute, Washington, D.C., March.

Objective: To determine state agencies' awareness and perceptions of the problems created by boom developments of energy production or extraction facilities

Method: Forty-three states and the Virgin Islands responded to the survey. Three important energy-producing states -- Kentucky, New Jersey and Ohio -- did not.

Variables: State awareness, perception of boom energy developments

Findings/implications: Responses revealed a variety of both existing and planned facilities. Community impact presently in or forecast for a region appeared to be greatest for the Atlanta, Dallas and Denver federal regions. The most commonly cited problems were inadequate capacity to plan, water pollution and local government management ability. The most commonly cited severe problems were housing, local government management ability and sewers. Items reported to cause little difficulty most often included insufficient warning of the booms, parking areas and adequacy of local government legal authority. Siting legislation, mine location, mineral/severance tax and an energy policy were the most often cited as relevant existing, pending, or proposed government actions. The study finds a lack of adequate support for programs already existing, rather than a dearth of state and/or federal programs which could be used to respond to certain impact created needs.

Schnorr, Janet K.

1979 Effectiveness of Energy Conservation Programs on Consumer Attitudes and Behaviors.

In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Futures, New York: Pergamon Press (Vol. 2, 900-906).

Abstract: Studies have shown that many consumers (about 50%) do not believe that there is an energy crisis and, further, that many believe the crisis has been contrived by government and the oil companies. There appears to be a correlation between belief in the crisis and education. Some consumers think that technology will overcome the problem, a belief which allows them to continue consuming energy extravagantly. Providing progressive feedback on the results of conservation efforts and positive incentives (monetary rewards, social recognition) may reduce energy consumption. Voluntary conservation will not appear until an energy ethic is internalized by society. Barriers to conservation include an unwillingness to change lifestyle, complacency about forthcoming technical solutions and doubts about government statements about the energy problem.

7245

Schuller, C. Richard, et al.

1975 Citizens' Views About the Proposed Hartsville Nuclear Power Plant: A Preliminary Report of Potential Social Impacts.
Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Objective: To determine the potential impact of a large nuclear power plant complex on a rural community

Method: A marginal frequency analysis was carried out of a random sample (N=350) of Trousdale County, Tennessee surveyed by interview during February 1975 to determine the potential impact of a large nuclear power plant complex on a rural community.

Variables: Socioeconomic background, demographic characteristics, attitudinal perceptions of the community, the changes respondents anticipate would accompany construction and operation of the plant and how they evaluate the changes which may be brought about

Findings/implications: People were apparently residing in the community because they liked it. Sixty-five % favoured the plant, 29% opposed it and 10% were undecided. The strongest supporters tended to be in business and labour. A small majority of farmers opposed the facility. The most adamant opponents were generally women. No differences between supporters or opponents emerged from other background indicators such as formal education, age and length of residence in the area. Support was most closely associated with the expectation of positive economic benefits. Opposition stemmed from concern over radiation and the potential for accidents at the facility, even though opponents tended to regard economic growth and development as desirable for the community.

7250

Schwartz, Timothy P.

1975 Societal Energy Consumption: An Evolutionary Theory and a Preliminary Empirical Analysis.

Unpublished Ph.D. dissertation, Department of Sociology, University of North Carolina (Chapel Hill).

Objective: To test an evolutionary theory of energy consumption

Method: A correlation and regression/path analysis was undertaken of cross-national time-series data (largely collected from UN sources) on 120 societies. The data are for 1929 and 1969.

Variables: The author provides 34 operationalizations of nine theoretical constructs (e.g., urbanization, division of labour, and energy consumption) -- all of which are macrosocial structural characteristics of nations. The research views societal energy consumption as both a major cause and effect in a complex matrix of socio-demographic-economic forces.

Findings/implications: Societal energy consumption is a major causal element in determining aspects of social structure (e.g., intrasocietal contact and economic productivity). These variables appear to have important causal ramifications for urbanization, the division of labor and intersocietal contact which, in turn, influence energy consumption. The results, while suggestive, are tempered by the limitations of the data base.

Schwartz, T.P.

1978 Energy Research And Behavioral Science: Important Insights That
 Are Neglected.

Energy Research Report, 4, 22 (December), 3-5.

Abstract: Oversimplified assumptions about how people behave -- from citizens to managers to political leaders -- continue to hamper efforts to alter energy-use patterns. We continue to believe that people will consume less energy when they adopt a "conservation ethic," despite widespread and repeated evidence that the energy saved is minimal. Another misconception is that economic productivity and growth in energy consumption are interdependent. Evidence that the relationship is variable both for societies and families, especially poor families, continues to grow. Furthermore, contrary to popular belief, many citizens believe that growth and conservation are compatible and that the United States has formidable energy problems. They do not believe that the problem is simply a matter of running out of fuel in the near future. They are convinced that energy shortages are due as much to political and social causes as to physical shortages. For this reason, even the most ardent believers in impending energy shortages have made only minor changes in their energy consumption. Based on such findings, behavioural scientists suggest spending less time and money trying to change beliefs and attitudes about energy problems and more applying available knowledge to alter energy production and consumption patterns

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

7260

Schwartz, T. P. and Donna Schwartz

1974 The Short End of the Shortage: On the Self-Reported Impact of the Energy Shortage on the Socially Disadvantaged.
Paper presented at the 1974 meeting of the Society for the Study of Social Problems, Montreal.

Objective: To assess the differential impact of the energy shortage

Method: This is a study of the self-reported effects of energy shortage, based on a panel survey conducted in July and November 1973 and March 1974. A systematic sample (N=200), proportionate to city size, of heads of households was drawn from the city directories of Chapel Hill, Durham and Raleigh, North Carolina. Data were cross-tabulated using a significance level of .06.

Variables: The differential impact of energy shortage as self-reported by heads of households

Findings/implications: The energy shortage did not discriminate against socially disadvantaged groups. Nor did it discriminate more against groups with multiple social disadvantages. Finally, such discrimination did not merge and increase as the shortage endured and worsened.

7265

Sears, David O., et al.

1976 Political System Support and Public Response to the 1974 Energy Crisis.

Paper presented at the Conference on Political Alienation and Political Support, Stanford, California, May.

Objective: To examine the role of support for the political system in determining compliance to attitudes and actions that government defines as in the public interest

Method: The report is based on responses by Los Angeles County residents to the energy crisis of 1974. A multistage probability sample (N=1069) of Los Angeles residents aged 18 and over was used and interviews were conducted from February to March of 1974. Data on household electricity and natural gas usage were obtained from utility companies. Four major hypotheses were tested.

Variables: Support for the political system as indicated by diffuse system support, partisanship, the individual's longstanding symbolic loyalties and personal impact, all as related to the 1974 energy crisis in Los Angeles

Findings/implications: Diffuse system support was found to be significantly related to the official government energy line. Partisanship was also, as well as being strongly correlated with system support. The personal impact of the crisis had virtually no effects at all in terms of citizens' attitudinal response (i.e., it did not inspire general conformity to or rebellion against the official government interpretation of and response to the energy crisis). Neither system support nor partisanship contributed significantly to behavioural reductions in energy consumption; however, the personal impact of the crisis did. Overall, attitudinal predictors (system support, partisanship and perceptions of the crisis) are the most important predictors of attitudinal response (policy support). Personal impact rather than longstanding political attitudes was the major factor in behavioural compliance.

Seasonwein, Roger, Associates, Incorporated
1979 Public Attitudes on Energy.
Union Carbide Corporation.

Objective: To find out how Americans responded to various energy options and other energy-related questions

Method: A survey was taken of a national probability sample of 1000 Americans, 18 years and older between May 9 to 20, 1979.

Variables: Dependent: attitudes toward energy costs, energy efficiency/technology, solar energy; energy from coal, governmental regulation, environmental regulation

Independent: region, sex, age, income, education

Findings/implications: A slight majority of the respondents (51%) felt that low-income families should pay less for energy, especially in home heating. Nine out of ten believed that technology would become more efficient and 81% believed that solar energy is a viable alternative. Three-quarters of the respondents favoured the use of coal and slightly over half felt that coal should be used more. Half of the respondents thought that government regulations hinder energy production, while only 40% say that this is not the case. Half of the respondents also felt that environmental regulations do not affect energy production and 60% believed that environmental regulations should be reduced a little. Regional breakdowns generally had little effect on the reported results, except in the case of the western region which was more favourable towards solar energy. Men were knowledgeable and in favour of environmental controls. Middle-aged respondents were generally conservative in their attitudes, while younger respondents supported environmental protection. As income and educational levels increased, support for low-income families decreased, belief that governmental regulations hampered energy production increased and favourable attitudes towards solar energy increased. The results provide a wide variety of information and demographic characteristics which could be very beneficial in policy making and the development of target populations for policies.

7275

Seaver, W. Burleigh, and Arthur H. Patterson

1976 Decreasing Fuel Oil Consumption Through Feedback and Social Commendation.

Journal of Applied Behavior Analysis, Vol. 9, 2 (Spring), 147-152.

Objective: To examine the short-term effects of feedback and social commendation on the conservation of fuel oil as a step in the development of strategies for altering consumption patterns in the long term

Method: A sample of 180 households was drawn randomly from the list of continuing accounts (11 years -- capacity of 300 gals.) in a university community in central Pennsylvania. The sample was divided into two experimental groups and a control group to assess the effects of feedback information and feedback information coupled with social commendation. The study was conducted from February through May 1974.

Variables: Dependent: fuel consumption

Independent: feedback; feedback and commendation

Findings/implications: Over the period studied, consumption was reduced to 0.129 gallons per degree day for the feedback plus commendation group, compared to 0.143 gallons per degree days for the feedback group alone. The control group reduced their consumption to 0.146 gallons per degree day. In the short term, feedback coupled with commendation produced a significantly greater amount of reduction. This implies that the reward of social commendation is an acceptable and desirable form of social recognition in the public sector. However, the short-term nature of the study means that further research is necessary to determine its long-term acceptability.

Selection Consulting Center

1978 California Residential Energy Consumption Survey: Knowledge, Attitudes, Characteristics of the Home, and Appliance Saturation and Usage.
Sacramento, Ca.

Abstract: A sample of 941 residential energy consumers representative of the entire State of California participated in individual one-hour interviews. The residents were found to be well-informed and discriminating consumers, with excellent knowledge of the energy required for performing household functions. They see themselves as moderate users of energy and plan to decrease consumption in the future. Their attitudes towards energy conservation are strongly positive. The most important conservation measures were seen as insulating attics and walls. Strong preferences were found regarding load-management alternatives. Generally, load sharing and time-use pricing were seen as most acceptable, primarily because of their relatively low perceived cost and inconvenience. Of the possible legislatively prescribed mandates considered, requiring new homes and appliances to be energy-efficient was the most acceptable; banning the use of natural gas for new pools was judged the least effective. Solar energy systems were thought to be too expensive to purchase and install, as well as unattractive. Only a limited amount of the billing information had been returned when this report was published

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Seligman, Clive, and John M. Darley

1976 Feedback as a Means of Decreasing Energy Consumption.

Paper presented at the Annual Meeting of the American Sociological Association, August.

Objective: To determine the effect of consumption feedback on energy consumption in residential housing

Method: From July to September 1975, an experimental study was conducted of 40 homeowners in a planned urban development of identical dwellings in central New Jersey. Participants were randomly divided into control and feedback groups. A baseline relationship between daily average temperature and daily consumption was established, using regression analysis, from readings of electric metres for five weeks. Both groups were told that air conditioning is the biggest energy user and should be reduced. The feedback group was given daily (Tuesday to Friday) percentage scores indicating the degree to which participants' actual consumption corresponded to predicted consumption. Experimental data were subjected to analysis of variance.

Variables: The effect of information feedback on the energy conservation behaviour of families in connection with the use of home air conditioning

Findings/implications: Both groups used significantly less electricity during the treatment period compared to the baseline, partly due to cooler weather in the treatment phase. During the treatment, the feedback group consumed 10.3% less than the control group. Within the feedback group, the lower the initial level of consumption, the greater the amount of conservation during treatment. This suggests that feedback is more successful with moderate users than with high users of electricity.

Seligman, Clive, et al.

1976 Psychological Strategies to Reduce Energy Consumption: First Annual Progress Report.

Princeton, New Jersey: Princeton University Center for Environmental Studies, November. Report No. 41.

Objective: To review ongoing research designed to produce and test psychological strategies for helping people achieve significant reductions in their residential energy consumption

Method: Work to date was done on a recently completed planned urban development (PUD) of 3,000 homes at Twin Rivers, New Jersey. Each home had identical dimensions and appliance packages, thus facilitating comparisons. Descriptions and results are given for four feedback experiments, involving summer electricity usage, setting specific goals and alternative types of feedback under summer and winter conditions. Also detailed are progress on thermostat research to achieve automatic dial-down and results of an attitudinal survey in the Twin River project. The four experiments were conducted respectively on 40 three-bedroom townhouses, 100 three-bedroom townhouses, 325 residents who had not participated in earlier studies (148 responded favourably to the request), and 125 subjects from experiment 3 who were asked to continue (54 declined).

Variables: The effects of four feedback techniques on energy consumption by residents in a PUD

Findings/implications: Experiments 1 and 2 yielded significant reductions in the consumption of electricity, particularly when a difficult goal was adopted by subjects. The results of experiments 3 and 4 were equivocal but encouraging. All groups in experiment 3 exhibited reduced gas consumption, while the two feedback groups in experiment 4 achieved moderate reduction compared with the control group in each experiment. The researcher concluded that, taken together, the studies indicate that feedback can be an effective strategy for energy conservation.

Seligman, C., et al.

1979 Predicting Summer Energy Consumption from Homeowners' Attitudes.
Journal of Applied Social Psychology, 9, 1, 70-90.

Objective: To begin work on establishing the relationship between attitudes towards energy use and actual residential energy consumption, laying the groundwork for research on the design of energy campaigns to change these attitudes directly

Method: Survey I: 80 couples in New Jersey were contacted, 56 eventually returning usable questionnaires. Consumption data was obtained from utilities. Survey II: 100 requests were made and 69 usable responses obtained. The second survey focused on further investigation of results obtained in the first survey.

Variables: Dependent: actual electricity consumption, thermostat control behaviour

Independent: demographics; attitudes (perceived bother in saving energy, perceived effect on health, perceived legitimacy of energy crisis, perceived discomfort in saving energy, belief in scientists' ability to solve the crisis, perceived role of the individual in terms of conservation); moral aspects.

Attitudinal questions were factor analyzed and these factors were then regressed against actual consumption.

Findings/implications: In Survey I, four attitudes/perceptions emerged as important: effects of energy conservation on health and comfort; monetary return for conservation efforts; the impact of individual conservation efforts; and legitimacy of the energy crisis. In Survey II, there were six factors: personal comfort; belief in scientists' ability to solve the crisis; the individual's role in conservation; effort and results; health; and the legitimacy of the crisis. The factors accounted for 55% and 60% of the variance in actual consumption, respectively. The comfort and health factor was the single best predictor of consumption, in both cases. The emergence of the efforts and results (monetary return for efforts) factor may mean that homeowners would be more willing to conserve energy as costs of energy rise (or as rewards increase). Campaigns should be developed to inform consumers about means to keep dwellings comfortable while decreasing energy usage, emphasizing the role of the individual in energy conservation. Results obtained in this experiment need to be tested with different subjects under different weather conditions.

Shahabuddin, S., and Y.C. Chang

1978 Consumer Attitude Towards Fuel Consumption In the United States.
Urban Syst. 3, 2-3, 117-122.

Abstract: The consumer's choice between rationing and fuel consumption depends upon income, job category, number of cars owned and age. In the study, income and age variables proved important in determining the choice a consumer would make between rationing and price increases. A consumer with a higher income and younger age would likely opt for price increases over rationing and vice versa. Also, consumers who drive the most will favour price increases over rationing and vice versa. Other sociodemographic factors were not found to be good predictors of the choice a consumer would make. The study concludes that, to curtail gasoline consumption, increased prices would be an effective tool while at the same time subsidizing lower-income and aged consumers.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

Shanklin, William L.

1978 The Energy Crisis and Consumer Behavior.
 Atlanta Economic Review, 28, 3 (June), 28-33.

Abstract: Marketing management, if guided by salient behavioural research, can help federal policy makers to mitigate the energy crisis. Some of the more important issues of the energy crisis are considered from an integrated economic/marketing/social psychological perspective. Economic solutions to the problems of energy conservation are discussed in terms of strategies for pricing, promotion, distribution, products and marketing mix. Experienced marketing executives and consumer behaviour researchers are needed in the Department of Energy to aid in forming energy policies that take account of marketing strategies. Only a combined technological behavioural approach to the energy crisis will stop the energy shortages that threaten to disrupt the social and economic stability of the United States.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Shepard, Lawrence

1977 The Consumer Impact of Alternative Allocation Plans: The Case of Gasoline.

Journal of Consumer Affairs, 11, 1 (Summer), 47-62.

Abstract: The paper's objectives are: (1) to analyze four extramarket allocative mechanisms (rationing, "lifeline," rationing with resale and tax-rebate programs); (2) to assess the effects of the policies on consumers' purchasing patterns; (3) to assess the impact of a reduction in gasoline consumption of 10% on different income groups; and (4) to deduce the welfare implications of the policies. Rationing prohibiting resale of coupons would affect high users and not those consuming less than the rationed amount. The lifeline approach allows users to buy amounts (at a higher price) in excess of the rationed amount. Rationing with resale allows lower users to benefit from unused coupons by selling them and high users to buy more than their rationed share. Tax-rebate plans offer rebates to those who use less than the designated amount and taxes those who use more. Conventional rationing would provide citizens who use intermediate amounts with the highest level of welfare available through the four plans. Rationing with the resale or the tax rebate approach would be superior to the lifeline alternative, using the consumer welfare criterion. The two plans would also benefit small and large users by allowing them to trade with each other. Conventional rationing and lifeline would require significant conservation measures on the part of high income gasoline consumers. The other two plans would encourage all to conserve while redistributing income to the lower-income consumers.

7315

Sierra Pacific Power Company

1978 Home Energy Survey: Report No. 1.

Reno, Nevada: Sierra Pacific Power Company.

Objective: To establish the saturation levels of major appliances, home heating methodologies and demographic data on residences and occupants for Sierra Pacific Power Company's residential service area

Method: A survey questionnaire was included in customers' bills mailed in June 1977; 114,317 were distributed and 25,964 were returned.

Variables: Residence demographics, including: type and number of units in the building, ownership status, age, square footage, appliances used, type of cooling and heating system and household data (e.g., number of occupants, education, occupation, income)

Findings/implications: Frequency distributions were compiled for the variables. No other analysis was completed.

7320

Sierra Pacific Power Company

1978 Home Energy Survey: Report No. 2.

Reno, Nevada: Sierra Pacific Power Company.

Objectives: To establish the saturation levels of major appliances, home heating methodologies and demographic data on residences and occupants for the Sierra Pacific Power Company's residential service area

Method: A survey questionnaire was included in customers' bills mailed in June 1977; 114,317 were distributed and 25,964 were returned.

Variables: Residence demographics, including: type and number of units in the building, ownership status, age, square footage, appliances used, type of cooling and heating system and household data (e.g., number of occupants, education, occupation, income)

Findings/implications: Data of Report No. 1 are grouped by revenue centres, rather than presented together in the entire service area (broken down by state, district and city).

7325

Sierra Pacific Power Company

1978 Demographic and Electrical Consumption Profiles.
Load Research Department, Report No. 3.
Reno, Nevada: Sierra Pacific Power Company.

Objective: To compile demographic and electrical consumption profiles of three specific groups of consumers: (1) Senior Citizens' Property Tax Assistance Act applicants; (2) small users of electricity; and (3) Supplemental Security Income recipients

Method: The study was conducted over 12 months, ending in August 1975. Profiles were collected for the groups and compared to profiles of the baseline population (all customers). Sample sizes were 2043, 766 and 574 for the three groups, respectively.

Variables: Demographics, actual electricity consumption

The three groups were divided into four strata: (1) cooking/lighting/ refrigeration; (2) space heating as well; (3) water heating as well; and (4) both space and water heating as well. The strata were cross-tabulated with the descriptive variables and a multiple regression analysis was done.

Findings/implications: Senior citizens tended to be single, own their own single-family dwelling, with an average age of 71 years and an average income of \$6,119. Small users, those who received a bill in any month of the study less than the median consumption for the month, tended to be members of two-person households, living in single family dwellings, married, without school children, not on farms and to have a median income of \$12,500. Those who were receiving supplementary income were predominately aged or disabled and female, with an average income of \$211 per month.

7330

Sierra Pacific Power Company

1979 Home Energy Survey: Electrical and Gas Analysis: Report No. 4.
Reno, Nevada: Sierra Pacific Power Company.

Objective: To correlate individual consumption of power by demographic and appliance and space heating responses from the Sierra Pacific Power Company home energy survey (see Reports No. 1 and 2)

Method: A survey questionnaire was included in customers' bills mailed in June 1977; 114,317 were distributed and 25,964 were returned.

Variables: Dependent: electrical and gas consumption of households (as per company records)

Independent: residence and household demographics, appliances used, type of cooling and heating system (60 variables in all)

Users were divided into four categories (strata) according to the extent of electrical usage and cross-tabulations were performed, plotting the descriptive variables against electrical consumption for each strata. Multiple regression analysis was performed to determine which of the variables had a significant influence on electrical consumption, electrical water heating consumption and gas consumption.

Findings/implications: Electrical consumption The independent variables explained 44% of the variance in electrical consumption. Some major factors appeared to be the type of water heater, use of home full time, type of heating system and occupation (notably farmer/rancher).

Electrical water heating consumption. Independent variables explained 46.7% of the variance. The number of occupants and the presence of a dishwasher and/or clotheswasher appeared to be most important. Gas consumption Independent variables explained 4.5% of the variance (on an annual basis). For the winter only, 44.5% was explained. Major factors (in winter) appeared to be the presence of a natural gas water heater, number of bedrooms and bathrooms, and the use of portable heaters.

Slavin, Robert E., and John S. Wodarski

1977 Using Group Contingencies to Reduce Natural Gas Consumption in Master-Metered Apartments.

Baltimore, Maryland: The John Hopkins University.

Objective: To investigate the use of group feedback and group contingencies in attempting to reduce energy (natural gas) usage in master-metered apartments

Method: The experiment was performed in a 144-unit garden apartment complex (12 buildings) in Baltimore, Maryland over a three month period during the winter of 1977. There were three treatments, each received by one-third of the units: small group contingencies, large group contingencies and control. A questionnaire was administered upon completion of the experiment, asking respondents about their energy-conserving behaviour. Seventy-four questionnaires were returned in usable form.

Variables: Dependent: units of gas used, self-reported conserving behaviour

Independent: control (all units received a letter appealing for conservation); large group contingencies (involved two buildings) -- 24 units -- per group. Units received feedback letters every two weeks and, at month's end, actual gas consumption for the group was compared to predicted usage. If predicted use exceeded actual use, group members received a rebate; small group contingencies (same as the large group, except that groups were comprised of 12 units -- one building).

Findings/implications: The large group contingencies significantly reduced usage vs. control for the first month but the difference disappeared in the next two months. The small group contingencies did not reduce consumption relative to control and, in fact, small groups used more gas than the control groups in one month. There was considerable variance from building to building in terms of the gas used. The large and small groups reported more conservation behaviour than the control group. The results suggest that conserving behaviour can be influenced by group contingencies. It may be that the rebates received were too small to motivate residents to conserve. All feedback came by mail, which is a poor mechanism for forming group norms.

7340

Slavin, Robert E., Wodarski, John S., and Bernard L. Blackburn
1978 A Group Contingency for Electricity Conservation in Master-Metered Apartments.
Baltimore, Maryland: The John Hopkins University.

Objective: To investigate the effectiveness of a group contingency based on the performance of very large groups

Method: Two experiments are reported. The first involved a 166 unit apartment complex in Baltimore (Rice Hill), comprised of one tower of 40 units and two of 63 units. The units were all electric and housed elderly residents. The treatment was introduced to the 32 units at three week intervals. The second study involved 255 units (Nevermoor) made up of three towers of 82, 88 and 85 units. These units had gas ranges and received the same treatments as in Study I, with a few minor exceptions as noted below.

Variables: Dependent: actual electricity consumption

Independent: treatment (notification of resident meeting -- one letter and one reminder; resident meeting; letters to all residents summarizing the discussions held); group contingencies actual electricity consumption was measured every two weeks and compared to the predicted or expected consumption and feedback letters, including rebates if actual consumption was less than expected, were sent to residents; a post experimental questionnaire). In Study II, the following changes were made: residents received only 50% of the value of the energy saved in the form of rebates (vs. 100% in Study I); payments were made only every four weeks (so as to increase the size of the rebate); and a \$5 bonus was paid the first time a tower exceeded 10% energy saving for a two-week period.

Findings/implications: In Study I, the three towers decreased actual consumption by more than expected, 11.2%, 1.7% and 4.0%, respectively. The figures were 9.5%, 4.7% and 8.3% for Study II. In Study I the effects were strongest immediately following the initiation of the treatment and tended to decrease over time. This trend was not evident in Study II. Study II shows more conclusively that group contingencies can reduce electrical consumption in master-metered apartment buildings. The evidence tends to support the authors' contention that large group contingencies are more effective than are those involving small groups. Notably, in the case of Study II, residents did perceive a group effort toward the group goal. Two major research questions are suggested by these experiments; How long will the experimental contingencies continue to modify energy consumption behaviour? and Would the contingencies be as effective if they were administered by apartment managers rather than by outside researchers?

Smith, B.W., and G.R. Frey

1975 Factors Influencing Spatial Consumption of Energy in the United States.

Tijdschrift Voor Economische en Sociale Geographie, Vol.66, 4, 246-250.

Objective: To measure the influence of selected variables on the spatial distribution of per capita aggregate energy use in the United States

Method: Correlation and regression of 1971 aggregate U.S. energy consumption using secondary data from the U.S. Departments of Census and Interior, the Federal Highway Administration and the National Oceanic and Atmospheric Administration.

Variables: Dependent: energy consumption

Independent: per capita scores (value added by manufacturing, value added by minerals production, value added by agriculture output); income; total miles travelled; climate

Findings/implications: The major factors influencing the spatial pattern of energy use of states are the localization of manufacturing and minerals production. Income, climatic conditions and volume of traffic appear to bear little, if any, relationship to the pattern of aggregate energy use.

Socolow, R.H.

1978 Twin Rivers Program On Energy Conservation In Housing: Highlights
 and Conclusions.
 Princeton, New Jersey: Princeton University.

Abstract: Key results and conclusions of a field study of residential energy use, now in its sixth year, are reviewed. The research is being undertaken in a set of nominally identical townhouses in Twin Rivers, New Jersey, a recently built community of standard construction with gas space heating, electric central air conditioning and a full set of appliances. Average levels of energy consumption and their dependence on weather and building type have been established, thereby permitting detailed quantitative studies of the sources of remaining variability. Starting from this baseline, the authors established the level of change in energy consumption that followed the energy crisis in the autumn of 1973 and performed two kinds of controlled experiments: (1) experiments where a set of modifications (retrofits) were made to the building structure, and (2) experiments where feedback was provided to residents on a regular basis, reporting their level of consumption of energy. Conclusions drawn from modeling and experimentation are presented here, with emphasis given to those results bearing directly on the character of programs to retrofit and national housing stock. Photographs and graphical displays of data are provided.

Note: Abstract obtained from:
 Technical Information Center
 Department of Energy
 Washington, D.C.

Sparrow, Tom

1977 Socio-Economic Factors Affecting the Adoption of Household Solar Technology: Preliminary Findings.

Paper presented at Social and Behavioral Implications of the Energy Crisis: A Symposium, Woodlands, Texas, June.

Objective: To study the diffusion of household solar heating technologies

Method: Analysis is based upon household telephone interviews (N=45) conducted throughout the United States. Respondents were all owners/users of solar custom homes.

Variables: The factors contributing to the diffusion of household solar heating technologies

Findings/implications: The average income of respondents was high but appeared to be beginning to drop. Solar purchasers with incomes below the sample median reported difficulty with financing, but felt fixed costs to be less of a problem than did higher-income respondents. Developers/contractors seem to be replacing financiers for advice about solar homes. When local utilities were consulted, they proved less likely to encourage or facilitate the decision to go solar, undoubtedly a significant barrier to future public acceptance of this technology.

7360

Stearns, Mary D.

1975 The Behavioral Impacts of the Energy Shortage: Shifts in Trip-Making Characteristics.

Cambridge, Massachusetts: U.S. Department of Transportation, Transportation Systems Center, December.

Objective: To contrast aggregate and disaggregate shifts in trip making characteristics.

Method: National random sample surveys (N=700) were gathered by home interview in December 1973 and February 1974, and statistically analyzed. Data are from the National Opinion Research Center's Continuous National Survey.

Variables: The effect of the 1973-74 energy shortage on trip-making frequency, modes and purpose for households of different income level

Findings/implications: In the aggregate, the energy shortage seems to have mildly decreased trip frequency, not changed model use and decreased shopping trip incidence. Disaggregation by income level revealed that sub-poverty-level respondents apparently did not decrease trip frequency, significantly reduced their use of the auto-driver mode and reported no significant shifts in their incidence of trip purposes, all by contrast with above-poverty-level respondents.

7365

Stearns, Mary D.

1975 The Social Impacts of the Energy Shortage: Behavioral and Attitude Shifts.

Washington, D.C.: U.S. Department of Transportation.

Objective: To study selected household responses to the energy shortage, specifically with respect to shifts in behaviour or trip-making and conservation alternatives

Method: Data were drawn from the National Opinion Research Center national random sample survey (N=700) collected at the onset and peak of the national energy shortage of winter, 1973-74.

Variables: The effect of the 1973-74 energy shortage on trip-making frequency, mode and purpose for households of different income levels and on household attitudes towards the energy shortage and conservation alternatives

Findings/implications: Sub-poverty-level household members report significant modal shifts away from auto-driver trips, compared with no change for same for the former but decreased for the latter. Analyses of attitudes showed that social status is positively correlated with shortage perception, that the household's evaluation of its financial status is negatively correlated with expected duration of the energy shortage, and that negative evaluations of household energy shortage impacts are positively correlated with dissatisfaction with regard to enacted energy conservation policies. Households became less tolerant of conservation policies as they experienced the energy shortage.

Stein, J.P.

1976 The Determinants of Residential Appliance Possession and Fuel Choice in Los Angeles: A Cross-Section Analysis of 1970 and 1975 Data.

(Publication No. P-5733)

Santa Monica, Ca.: The Rand Corporation.

Abstract: This study reports on regressions explaining residential appliance possession and appliance fuel choice based on cross-section data for Los Angeles in 1970 and 1975. The data cover heating systems, air conditioners, water heaters, stoves, freezers, dishwashers, clothes washers and clothes dryers. In most cases, the data reveal highly significant responsiveness with the expected sign of cross-section patterns of appliance possession and fuel choice to determining variables. In making appliance choices, appliance owners and renters apparently take into account fuel costs, planned intensity of appliance use, the effects of family size and the storage cost of appliances. However, ceteris paribus, they have an income preference for electricity. They are aware of the effects of climate on energy costs. Other estimated effects generally confirm this rational behaviour in both years.

Stern, Paul C.

1976 Effect of Incentives and Education on Resource Conservation Decisions in a Simulated Commons Dilemma.
Journal of Personality and Social Psychology, Vol. 34, 6 (November), 1285-1292.

Objective: To study the effects of incentives and education on resource conservation in an experimental setting

Method: An experimental study of two strategies for escaping the double dilemma of conflicts between individual and collective good due to uncontrolled growth in a finite world and between short-term and long-term good. The strategies are: (1) making group-oriented behaviour pay off for individuals through incentives or strengthened group ties; and (2) inducing people to act from a long-term perspective by educating them about the probable consequences of their acts. The subjects were 48 undergraduate students drawn from classes in freshman Arts and Sciences and Introductory Psychology. Each was informed that he would be paid for participating. A 2 x 3 x 2 design was used in a four-person commons game modeled on a carpool in which forms of incentive and education were manipulated.

Variables: The effect of rationing, pricing and influence attempts on resource conservation decisions

Findings/implications: Price increase incentives produced a conservation effect which increased with their magnitude. Direct payoffs and a rationing system proved ineffective. Education by spot messages was not effective; however, detailed information about long-term consequences substantially extended the life of resources. The latter effect appeared early, even before that of incentives. The author cites reasons why the laboratory results are less likely to work in the world at large.

Stern, Paul C., and Eileen Kirkpatrick
1977 Energy Behavior.
 Environment, 19, 9 (December), 10-15.

Abstract: The paper examines the two major schools of thought regarding energy conservation, basically involving individual vs. group behaviour. Energy consumption is a "social trap," because the lure of immediate individual rewards leads people to consequent punishment (of the group as a whole). People perceive that in the short run they stand to lose more than they gain by conserving energy. To change behaviour, the contingencies of reward and punishment must be changed. Immediate reinforcers or punishers should be used to make action that is in the long-range interest of society benefit individuals in the short run (e.g., through lower bus fares or tax incentives to insulate houses). Strong incentives may harden the attitudes of some of the more confirmed energy users and may also convert people who value energy conservation into people who conserve only because it pays. The answer may involve a focus on the behaviour and attitudes of groups, using group social forces to mould behaviour and attitudes. Public commitment by group members to observe their group's conservationist norms may increase the continuance of conservation actions. National energy policy might be best implemented at the local level, where groups are more easily mobilized and the forces of personal commitment and group consciousness can be utilized to enhance conservation behaviour. Care must be taken that some groups do not bear more than their share of the burden.

7385

Stevens, W.; Kushler, M.; Jeppesen, J.; and N. Leedom
1979 Youth Energy Education Strategies: A Statistical Evaluation.
Lansing, Michigan: Michigan Department of Commerce.

Objective: To provide insight and guidance to the Energy Extension Service Youth Energy Project

Method: Questionnaires were administered to approximately 30,000 high school students. Students were pre-tested in February 1978, subjected to one or more of a number of treatments over the next few months and tested again in June 1978.

Variables: Dependent: students' attitudes towards energy conservation, automobile usage, conservation behaviour (e.g., use of energy in students' homes).

Independent: treatments (energy class taught by teacher; energy conservation presentation by other students; assemblies; dramas (futuristic energyless society); campaigns (carpooling); "Energy Today and Tomorrow" presentation); demographics: (grade, sex, own car/do not own car); the survey itself

Findings/implications: The results indicate that: (1) assembly format had negligible or negative impact; (2) student energy teams had no impact; (3) school-wide financial incentives had little impact (the carpooling campaign); (4) energy classes taught by teachers had a positive impact; (5) task-oriented instruction techniques whereby students are directly involved in attempting to save energy had a significant positive impact; and (6) testing (the survey itself) had a positive impact on student energy conservation attitudes and action.

Future efforts in the Youth Energy Project should be concentrated on in-class instruction and on task-oriented energy conservation programs.

Stewart, Charles T., Jr., and James T. Bennett
1975 Urban Size and Structure and Private Expenditures for Gasoline.
Land Economics, Vol. 51, 4 (November), 365-373.

Objective: To examine the determinants of per capita expenditures for automobile transportation fuel and gasoline, with particular emphasis on the effects of city size and structure

Method: Analysis is restricted to 134 SMSAs with 1970 populations of 200,000 or greater. Data for retail sales of gasoline and lubricants were obtained from the 1967 Census of Business, while the population data are from the U.S. Bureau of Census.

Variables: Dependent: per capita retail gasoline sales

Independent: region, ethnicity, age, income per capita, use of public transit, size, density, growth, price of gasoline

Findings/implications: The predictive power of the regression was generally low. SMSA size (-.0010) and rate of growth (-.0896) were found to be negatively related to per capita gasoline consumption, while the non-white proportion of the population was positively related to the per capita consumption (.1165). Age, income and price of gasoline were not significant in relation to per capita consumption. Regional location produced very significant results as the west and north central regions were much higher than the northeast and south.

Stucker, J.P.

1976 The Impact of Energy Price Increases on Households: An Illustration.

(Publication No. P-5585)

Santa Monica, Ca.: The Rand Corporation.

Abstract: The effects of energy price increases on households at different income levels are estimated. Direct expenditures are taken from household budget studies. Indirect consumption is estimated by applying input-output coefficients to non-energy expenditures. Total energy requirements are obtained and stated as percentages of household income for coal, crude petroleum, electricity and natural gas. These percentages permit estimates of the impact of energy prices on the households, assuming that the price changes result in no substitution among goods or energy forms. Several general conclusions are developed. (1) Direct energy expenditures are regressive in their structure; lower income households spend a greater portion of their budget on these items than wealthier households. (2) Indirect energy expenditures also seem regressive. (3) Indirect energy requirements represent over half of all energy transactions. (4) All energy taxes are probably regressive but taxes on refined petroleum products, such as gasoline, are the least regressive.

Stucker, James P.

1977 The Distributional Implications of a Tax on Gasoline.
Policy Analysis, Vol. 3, pp. 171-186.

Objective: To study the ability and willingness of various households to reduce their automobile mileage in response to an increase in the price of gasoline

Method: Data for households, personal travel and automobile ownership are provided by the U.S. Department of Transportation's Nationwide Personal Transportation Study which surveyed 5,000 households for the period 1969 to 1970.

Variables: Dependent: mileage, ownership, type of auto purchased, purpose of use, consumption of gasoline

Independent: income

Findings/implications: Automobile travel and ownership were positively related to income; the higher the level of income, the greater the amount travelled and the more automobiles owned. Also related to ownership is the fact that higher-income groups tend to own their new cars longer and tend to buy older cars. Furthermore, lower-income groups have a higher propensity to purchase medium-or small-sized cars, whereas higher-income groups tend to purchase luxury, large and foreign automobiles. The higher-income groups used their automobiles primarily for work-related purposes more so than lower-income groups. The implication for any tax proposal on gasoline is that, if the tax is generally applied, it would be regressive as lower-income groups use less energy and pay a higher percentage of their income on gasoline than the higher-income groups.

Stucker, J.P.

1978 The Effects of Fuel Economy Mandates and Taxes on Drivers: Impacts By Income Groups.

(Publication No. P-6127)

Santa Monica, Ca.: The Rand Corporation.

Abstract: This report investigates the effects of government policy options for conserving gasoline and determines the pattern of effects across income groups. Cost-estimating relationships for auto ownership and operation are derived for income groups based on types of cars, use patterns, the length of time the car is owned and the age of the car when purchased. Costs incurred through depreciation, maintenance, insurance and gasoline are estimated. An economic model simulating behaviour of the auto industry is used to forecast the effects of federal fuel economy mandates, fuel economy taxes and gasoline taxes. The model projects the equilibrium changes in prices, costs, sales, profits, individual and aggregate fuel economy, and government revenues when various levels of mandates and taxes are imposed in 1985. The output of the model becomes input to the user cost model to estimate impacts on different groups of drivers.

7410

Stucker, J.P. and T.F. Kirkwood

1977 The Economic Impact of Automobile Travel Cost Increases on Households.

(Publication No. R-1842-NSF/FEA)

Santa Monica, Ca.: The Rand Corporation.

Objectives: To study the effects of government policy options for conserving gasoline and improving air qualities with regard to the families that own and operate automobiles in the United States. The purpose is to determine the pattern of household effects across income groups and to investigate the various actions that the family may take to alleviate these effects.

Method: The data for this study were obtained from the Washington Centre for Metropolitan Studies and the U.S. Department of Transportation. Two studies were used: (1) the 1973 Life-styles and Energy Survey, which surveyed a national sample of 1455 in May 1973; and (2) the Nationwide Personal Transportation Study, which surveyed a national sample of 5,000.

Variables: Dependent: mileage, ownership, characteristics, type of use-purpose, costs, consumption, maintenance

Independent: income

Findings/implications: The wealthier half accounts for almost 75% of total gas consumption and any policies aimed at reducing consumption must be targeted at this group. The poor spend a higher percentage of their income on travel costs, especially gasoline, and any price or tax measures on consumption would be regressive. Several of the options available to families for offsetting automobile/travel costs are generally negative, without reducing auto trips or mileage. Such is the case of deferring maintenance or driving older cars which do not reduce consumption and are a greater economic burden on low-income families. Higher-income groups are better able to offset higher costs. Lower-income groups are not able to purchase energy efficient automobiles to the same extent as higher-income groups.

Sullivan, T.J.

1979 The Los Angeles Senior Citizen Lifeline Electricity Rate.
(Publication No. R-2278-DWP/NSF)
Santa Monica, Ca.: The Rand Corporation.

Abstract: Los Angeles' experience in providing low-cost electricity for its low-income elderly is studied. Introduced in 1975, the program covers over 89,000 households -- 80% of those estimated to be eligible -- where the head is at least 62 and annual taxable income under \$7,500. It offers a 50% discount on the first 360 kwh of bimonthly consumption which, at current prices, means an average of \$10 discount per household every two months. The special rate has stimulated approximately 429,000 kwh of additional electricity use bimonthly among the eligible population. But because rates were raised by 1.8 percent for other residential users to pay for the subsidy, their use fell 2,700,000 kwh/two months, a net reduction in total residential use. Analysis of lifeline consumption patterns shows that: (1) many lifeline households consume very little electricity; (2) small quantity consumers do not necessarily have low incomes; and (3) low-income consumers do not necessarily use small quantities of electricity.

7420

Sundstrom, Eric, et al.

1975 Community Attitudes Toward a Proposed Nuclear Power Generating Facility as a Function of Expected Outcomes.
Unpublished manuscript, University of Tennessee.

Objective: To study attitudes towards a proposed nuclear power generating plant

Method: In January 1975, a sample survey was taken of 350 residents of a rural Tennessee county. A factor analysis and simple multiple regression equation using factors as predictors were used to analyze variation in attitudes.

Variables: Attitudes about hazards, economic growth, power costs, social disruption, and community visibility, etc., as related to a proposed nuclear power plant

Findings/implications: Approximately two-thirds of the respondents expressed favourable attitudes towards the proposed nuclear plant. The five main variables listed above accounted for 54% of the variation in attitudes towards the plant. The strongest predictor -- perceived likelihood of hazards -- was inversely related to favouring the proposed nuclear power plant.

7425

Sundstrom, E.P., et al.

1977 Citizens' Views About the Proposed Hartsville Nuclear Power Plant: A Survey of Residents' Perceptions in August, 1975.
Oak Ridge, Tennessee: Oak Ridge National Laboratory, May. Report ORNL/TM-5801.

Objective: To determine consumers' attitudes about a nuclear plant being constructed near their residences

Method: A panel (N=288) of residents of Hartsville and Trousdale County, Tennessee was interviewed January 1975 and reinterviewed in August 1975. Trained local residents conducted the interviews and respondents received \$5.00 for participating. Two questions are addressed: (1) What factors are related to favorable attitudes toward the nuclear plant? (2) How do residents of Hartsville perceive their quality of life and how have their perceptions changed since the earlier survey?

Variables: Correlates of attitudes towards the Hartsville nuclear power plant, residents' perceptions of quality of life and changes in those perceptions during the process of facility planning and pre-licensing

Findings/implications: Sixty-nine % of the panel (the "supporters") said that, if they were deciding, they would permit the facility to be built. The remainder were "opponents." Attitudes toward the plant were consistent from January to August, even when measured through different questions. Most supporters would favour a coal-burning plant, while most opponents would also oppose a coal-burning facility. Perceived effects on the community are detailed. Supporters were much more likely than opponents to rely on TVA for information about the facility. Only among farmers and farm workers were opponents a majority. Opposition was also relatively prevalent among women and unemployed persons. Quality of life was also a relatively prevalent concern among women and the unemployed. Quality of life received high ratings which showed no appreciable decline from January to August, and no substantial differences between supporters and opponents.

Svalastoga, Kaare

1976 Space, Population, Energy, and Information in Seven Nations: 1820-1970.

International Journal of Comparative Sociology, 17, 1-2 (March/June), 30-47.

Objective: To examine the effect of four factors on the survival chances of a nation

Method: The nations studied are the United Kingdom, France, Germany, the U.S.S.R., the United States, China and Japan. The historical data used came from a variety of sources. Data are plotted and analyzed by correlation and regression.

Variables: The effect of space, homeland population, energy sources in coal equivalents per year and information revealed by science and technology on the historical power relationships among the nations selected

Findings/implications: A potential power index is deduced which shows that, in 1960, the United States was the most powerful and the United Kingdom the least powerful of the nations analyzed. For 1820, China was found to have the highest potential power, followed by Russia and the United Kingdom. By 1840, the United Kingdom was on top, a position it maintained through the century. The U.S.S.R. arrived in third place by 1880, with Germany in fourth place. By 1900, the order was the United Kingdom (by a wide margin), the United States, and Germany. The United Kingdom remained ahead for 1920, the United States held second place and the U.S.S.R. moved to third.

Talarzyk, W. Wayne, and Glenn S. Omura

1975 Consumer Attitudes Toward and Perceptions of the Energy Crisis. In Ronald C. Curhan (ed.), Combined Proceedings of the American Marketing Association, 1974 Conference, Chicago: American Marketing Association.

Objective: To examine consumers' attitudes towards various aspects of the energy situation

Method: Initial findings are reported from a national survey on consumer attitudes towards the energy crisis (N=1000 households) administered a few days after the oil embargo was officially listed (March 1, 1974). Factor analysis was performed on the survey data.

Variables: The effect of the energy crisis on consumers' activities, interests and opinions (AIO). Also, a varimax rotated factor analysis of the effect of differences in age, income, geographic area and other socioeconomic variables on consumer AIO statements.

Findings/implications: Greatest accord among respondents was found in attitudinal response to the energy shortage, the effect of the energy shortage on activities, blame and responsibility for the energy shortage, rationing of energy resources and the economic repercussions of energy resources. Cross-classifications between socioeconomic variables and the AIO statements, as related to the above six issues, revealed associations primarily between age vs. attitudinal response (older people reported less resistance to energy conservation) and between age and income vs. the energy shortage effect on activities (\$15,000-plus income classes were more likely to report a change in activities; middle-range age groups had less tendency to report a change in miles expended for shopping).

7610

The Becker Institute

1979 Impact of Three Mile Island on Massachusetts Attitudes Toward Nuclear Power.

Boston, Massachusetts: Becker Research Corporation.

Objective: To measure the impact of the Three Mile Island incident on the attitudes of Massachusetts residents towards nuclear power

Method: A telephone survey of 400 adults was conducted statewide in April 1979. Results were compared with those obtained in similar Becker polls conducted in September 1978 and February 1979.

Variables: Dependent: attitude toward the construction of a nuclear power generating plant in the area

Independent: sex, awareness of the Three Mile Island incident, perception of the effects of the Three Mile Island incident on the health of residents in the area

Findings/implications: The majority of those polled (54% vs. 34%) oppose nuclear power plant construction. Women oppose construction by a 3:1 margin (66% to 22%), while men are in favour of it by 47% to 42%. February 1979 results indicated 45% in favour of rapid development of nuclear plants and 46% against. Attitudes towards development are largely dictated by perceptions of the effects of the Three Mile Island incident on the health of area residents (76% of those who believe health was adversely affected oppose construction; 62% of those who believe health was not affected support construction).

Opposition to further nuclear plant construction can be expected, at least until the health issues are fully resolved.

7615

Thompson, Phyllis T., and John MacTavish

1976 Energy Problems: Public Beliefs, Attitudes and Behaviors.
Unpublished manuscript, Urban and Environmental Studies Institute, Grand Valley State College, Allendale, Michigan.

Objective: To determine the perceptions and beliefs that might underly energy-related behaviour

Method: A February 1976 random sample (N=600) survey of the Grand Rapids metropolitan area was drawn. The data were collected by interview and subjected to marginal frequency analysis.

Variables: Beliefs, attitudes and behaviour in relation to energy use

Findings/implications: The respondents were distinctly divided on energy questions. The larger group (over 50%) was cynical and distrusted the information they had received, did not believe oil and gas resources could be exhausted and regarded the gasoline shortages of 1974 as manipulation by industry and government. This group adopted few or no conservation measures. They tended to be at lower occupational levels, less educated and older than the smaller distinct group (approximately 20%) which believed that the energy problem was real and persistent. The latter believed in future exhaustion of oil and gas and expected energy shortages with higher development costs and large price increases. They adopted a variety of conservation measures. This group tended to be skilled, college educated and under 45.

Thompson, Ronald P.

1979 Evaluation and Monitoring of Customer Directed Energy Conservation Programs For a Large Investor-Owned Utility.
In R.A. Fazzolare and C.B. Smith (ed.s), Changing Energy Use Futures, New York: Pergamon Press (Vol. 1, 238-245).

Abstract: The paper describes the types of customer-directed energy conservation programs implemented by Pacific Gas and Electric (PG and E) and the techniques used to evaluate the impact and cost effectiveness of each conservation program. PG and E has a number of conservation programs, divided into residential and commercial/industrial/agricultural sectors. Residential programs include: (1) weatherization (includes inspections, insulation financing and information diffusion); (2) homes (encourages builders to build and consumers to buy homes which exceed state energy efficiency standards); (3) appliances and devices (encourages dealers to promote the sale of and consumers to buy energy-efficient devices); and (4) general awareness (includes a variety of educational activities). Commercial/industrial/agricultural programs include: (1) an energy utilization audit; (2) seminars; (3) school plant analysis; (4) energy management development; and (5) various pump efficient tests. As well, PG and E is involved in research into solar energy. The cost effectiveness (to PG and E) is energy savings. Programs must be cost-effective to customers as well before they can be convinced to implement them. PG and E evaluates programs through market research, engineering estimates and historical information.

Tienda, Marta, and Osei-Mensah Aborampah

1979 Energy-Related Adaptions in Low Income Non-Metropolitan Wisconsin Counties: Toward a Behavioral Approach.

Madison, Wisconsin: University of Wisconsin, Madison.

Objectives: To describe behavioural responses to changes in cost and availability of energy; to identify patterns of relationships between independent variables and corresponding sets of variables reflecting behaviour responses to more costly and tight supplies; and to discuss the relationship between actual fuel costs and compensatory behavioural responses elicited from households

Method: The sample consisted of 297 households in four non-metropolitan Wisconsin counties. Interviewing done by telephone in January and February 1978.

Variables: Dependent: behavioural responses were dichotomized as internal/external and pecuniary/nonpecuniary. Examples of responses for each cell are: internal nonpecuniary (fewer shopping trips, appliance usage, car pool); internal pecuniary (home retrofitting, change in the type of car owned); external nonpecuniary (heat loss due to structural defects, cost induced heat curtailment); external pecuniary (increase in income through an increasing number of householders working, use of alternative fuel for home heating)

Independent: physical structural features of home (including type of home, number of rooms, major appliances); housing tenure (own/rent, number of years in residence); socioeconomic characteristics of household (head's education level, family poverty status); demographic composition (age and sex of head and household members); change in average monthly cost of primary heating fuel between 1976/77 and 1977/78 seasons

Findings/implications: Examples of behavioural responses to energy by non-poor, near poor and poor families (proportion with affirmative responses) are: appliance usage (82%, 96%, 80%); use of a carpool to go to work (20%, 31%, 12%); home retrofitting (67%, 58%, 49%); use of an alternative fuel (40%, 35%, 12%); expenditure priorities (17%, 8%, 9%).

Canonical analysis of behavioural responses overall indicated a relationship between independent variables (tenancy status, number of years in current residence and single family home) and dependent variables (use of alternative fuels, changes in payment behaviour, selection of energy-efficient homes and changes in shopping behaviour). The canonical correlation was .605 (significant .035).

Tienda, Marta, and Osei-Mensah Aborampah (cont'd)

Separate canonical analyses corresponding to each of the four cells were computed. Solutions for the internal and external nonpecuniary cells were not significant at .05 level and the external pecuniary cell was barely significant. The variable most highly associated with a nonpecuniary adjustment response was tenancy status; with internal response, the variable was type of home (specifically whether it was an apartment); with external response, the variables were tenancy status, poverty status and family size.

Overall, physical structural characteristics seem to be more important in eliciting various behavioural responses, particularly those which entail pecuniary adjustment related to energy use. Changes in monthly heating costs did not emerge as a particularly important correlate of behavioural responses. The poverty status indicator produced "high loading" in only one -- and it was not statistically significant.

Changes in household spending and behaviour studied over a three-to-five year period may better show the differences in household coping strategies.

The authors believe that a predominantly conservation-oriented energy policy emphasizing voluntary rather than mandatory reductions may deflect attention from the differential ability of households to cope. The ability to reduce energy use may be directly related to income.

7630

Transportation Systems Center

1979 Comparison of Organizational And Operational Aspects of Four Vanpool Demonstration Projects.

Springfield, Virginia: National Technical Information Service.

Abstract: This report describes in detail the organizational and operational aspects of four projects involving vanpooling. The projects are located in San Francisco, California; Minneapolis, Minnesota; Knoxville, Tennessee; and Norfolk, Virginia. All involve third party providers and multiple employment locations. This report compares the projects with respect to: procedures; driver and rider application and selection procedures; van acquisition and provision arrangements; and financial aspects such as cost structures, driver lease fees, passenger fares and project funding. By highlighting the similarities and differences among project designs, the authors state that the information contained within the report is relevant not only to the ongoing evaluations of these projects, but also to organizers of similar vanpooling in other locales.

Tree, D.R., and J.F. Hamilton

1978 Energy Measurements of Major Home Appliances In Four Residential Homes.

Presented at Conference on Major Home Appliance Technology for Energy Conservation, Lafayette, Indiana, February.

Abstract: The Ray W. Herrick Laboratories measured the energy consumption of some major appliances in four residential homes. This paper describes the test homes, the people living in them, the appliances measured and the measured energy consumption. In addition to measuring energy consumption, the number of times and the total time some appliances were used were also measured. A sampling of this data is also presented. The northeastern Ohio homes are three-bedroom, two-bathroom, ranch-style homes with 1145 square feet of living space. All had a full basement. There were some differences, the main one being that home B had less insulation in the ceiling. Other than the parents, there were two children. Data are presented on energy consumption but no attempt has been made to compare energy usage.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

7640

Tuso, Margaret A., and E. Scott Geller

1976 Behavior Analysis Applied to Environmental/Ecological Problems: A Review.

Unpublished manuscript (available from Virginia Polytechnic Institute and State University). Summarized in the Journal of Applied Behavior Analysis, 9, 4 (Fall), 526.

Objective: To summarize the findings of a number of studies relating to behavioural manipulations and interventions designed to influence ecologically-related behaviour.

Method: A topical set of summaries of the research designs, procedures, results and conclusions of recent behavioural interventions for ecological rebalance. The topic most germane to the present purpose is "Energy Consumption" (pp. 42-49) where a number of studies dealing with behavioural manipulations to achieve energy conservation are described.

Variables: Effectiveness of behavioural measures, as reported by various studies, to achieve energy and materials conservation

Findings/implications: Reinforcement procedures for litter control, recycling and energy conservation show that cash payments or incentives of monetary value have proven effective, as have contingencies administered in the form of large-scale lotteries, group contests, token economies and individual rewards based on specific levels of performance. Difficulties enumerated include the transiency of effects and the number of personnel and amount of time necessary to conduct the projects.

8005

U.S. Community Services Administration

On- Small Farm Energy Project.

going Three-year experimental study initiated October, 1976 (Center for Rural Affairs, P.O. Box 405, Walthill, Nebraska, 68067).

Objective: not stated as report not completed

Method: An experiment is being conducted in Cedar and Knox Counties, Nebraska to determine if owners of family farms will respond to information and technical assistance designed to sharply reduce non-renewable energy consumption on the farm. The stated goal is to achieve energy self-sufficiency. The 50 family farms that volunteered were divided into an experimental group of 25 and a control group of 25.

Variables: The effect of information and assistance on family farmers' willingness to adopt energy saving practices and technologies

Findings/implications: Major findings are not yet reported. The preliminary result is that farmers in the experimental group readily commit themselves to energy conservation practices.

U.S. Department of Housing and Urban Development

1978 Selling the Solar Home: Some Preliminary Findings.

Residential Solar Program Report #1.

Washington D.C.: U.S. Government Printing Office.

Objectives: (1) to serve as a guide to marketing approaches utilized and market experiences to date in the HUD demonstration program; (2) to summarize some of the preliminary findings emerging from interviews of actual participants in the residential solar marketplace.

Method: The Residential Solar Heating and Cooling Demonstration Project awards grants to builders and developers of solar homes. Interviews are conducted with the key actors (builders, buyers, lenders, as well as comparative builders, etc.). The results of these interviews form the bulk of this report.

Variables:

Builders:	experience; number of units built per year; reasons for selecting particular systems; perceptions of target markets; satisfaction with HUD program
Purchasers:	demographic characteristics; reasons for moving; factors in purchasing decision (as stated by purchasers, and as perceived by builders); satisfaction with solar home system
Lenders:	type; size; lending considerations for construction finance; lending considerations for permanent finance
Utilities:	attitudes toward solar energy; expected impact of widespread solar utilization; expected utility involvement in solar energy

Findings/implications: Builders have experienced some problems in obtaining solar equipment and in installing the solar systems. It would appear that a home must meet a prospective purchaser's basic housing needs before a solar unit is given serious consideration. Purchasers tend to be young and well educated with higher than average incomes. They are, however, not significantly different from others who have bought similarly priced conventional homes in the same areas. Buyers are attracted to solar homes because of the general features of the home and out of an interest in energy savings. About half of the utilities surveyed believe that solar energy is now a practical alternative to their service area. Many of the companies are involved in research in developing answers to customers' inquiries about solar energy.

8015

United States Travel Data Center

1974 Energy Shortage Travel Impact Survey: Summary Report.
Washington, D.C.: U.S. Travel Data Center.

Objective: To identify: (1) the impact of gasoline shortages and air departure reductions on recent business travel and possible effects in the future; (2) possible changes in weekend travel resulting from energy shortage effects; (3) the role gasoline shortages are playing in the formulation of vacation plans; and (4) how consumers view the oil shortage in relation to travel

Method: Personal interviews were conducted nationwide in March and April 1974. A total of 1,273 interviews were completed.

Variables: Dependent: perceptions of gasoline shortages; perceived accuracy of information about gasoline availability by source; number of weekend trips taken in the previous year and planned this year; changes in weekend travel plans; effect of the shortage on business travel; major vacation trips taken in the previous year and planned this year; vacation time away from home in the previous year and planned vacations; travel outside the United States; package tour travel plans used previous year and planned this year; possible effects of \$1 per gallon of gasoline price on vacation plans; serious worries concerning vacation trip planned

Independent: demographics, region of residence

Findings/implications: About 25% of adult drivers perceived the gasoline shortage in their area to be very or fairly severe. A large proportion of drivers (59%) were able to identify other regions with less gas available than their home region. The American Automobile Association was identified as the most accurate source of information concerning shortages by more drivers than either television or newspapers. Weekend travel would be reduced for the coming year somewhat and concentrated closer to home. Most businessmen (80%) indicated that the shortage had little or no effect on their business travel. There was no significant change in the number of people planning vacations. There was, however, a drop in the proportion who said they use autos for their vacation (84% to 71%). There was no significant change in the preference for travel within the vs. outside the United States. An increase in the price of gasoline to \$1 per gallon would produce drastic cutbacks in vacation travel, while a 20% increase in air travel fares would not produce as dramatic a change.

Verhage, B.J.

1978 Energy Conservation: A Study of its Adoption Process by Consumers
 In The Netherlands.

Austin, Texas: University of Texas.

Abstract: Promotion of the most economic consumption of energy possible is one of the U.S. government's current policy objectives. Success in implementing this policy depends largely on the use of appeals for conservation to which consumers are most likely to respond. Therefore, the study first investigated which attitudes in energy-related matters are prevalent among consumers. In developing the research hypothesis, several concepts from the diffusion of innovations theory were applied. In this context, "compatibility" was assumed to be operative. It was defined as the degree to which an innovation or new idea, such as an energy-conservation measure, is perceived as consistent with the existing values of the potential adopter. It was then argued that political parties in particular take part in shaping the values and attitudes of Dutch consumers. The study subsequently measures, in terms of socio-demographic variables, the differences between those who conserve relatively large amounts of energy versus those who conserve relatively little energy.

Verhallen, Theo M., and W. Fred van Raaij
1979 Household Behavior and Energy Consumption.
Tilburg, The Netherlands: Tilburg University.

Objective: To investigate the relationship between consumers' attitudes and their household behaviour and the home they own or rent, the products they purchase that save or use energy and their energy consumption in the home

Method: The sample consisted of 145 households in Vlaardingen, Holy-North (The Netherlands). Attitudes were surveyed in November 1976 and behaviour and natural gas consumption were monitored over the next year.

Variables: Dependent: energy consumption, household behaviour

Independent: (1) on household behaviour: socioeconomic characteristics (age, income, education, occupation, family size); attitudes (price consciousness, home comfort, energy consciousness); home evaluations and special circumstances (e.g., householder evaluation of home comfort and heating problems, absence during weekends, shift service, etc.); home characteristics (superior vs. standard insulation, fully attached vs. semi-attached, wind orientation); (2) on energy consumption: household behaviour (e.g., temperature of the house during absences, use of pilot flame, etc.); home characteristics (as above); socioeconomic characteristics (as above); special circumstances (as above).

Findings/implications: Differences in attitudes explain only 5% of the variance in household behaviour; home evaluations and special circumstances explain up to 18%, socioeconomic characteristics 9%, and home characteristics 7%. Taken together, the factors account for only 28% of the variance. Differences in household behaviour explain 26% of the variance in energy consumption. The most important are the temperature the thermostat is set at during absences, the use of the pilot flame and the bedroom temperature set while sleeping. Differences in home characteristics explain 24% of the variance in energy consumption, special circumstances 11%, and socioeconomic characteristics 6%. The variables together explain 58% of the variance in energy consumption.

Further, it was found that home improvements which tend to decrease energy consumption may be offset by changes in behaviour (airing rooms and leaving hall doors open more often).

Campaigns aimed at changing attitudes, and consequently household behaviour, may not be worthwhile. Individual feedback information approaches may be more effective but are expensive. Changing attitudes in an energy-conscious direction should concentrate on increasing consumers' perceptions of their responsibility for and effectiveness in contributing to energy saving.

Vertinsky, Patricia

1979 The Use of Mass Communication Strategies to Promote Life-Style Change.

In Peter Nemetz, (ed.), Energy Policy: The Global Challenge.

Institute for Research on Public Policy, Montreal, 383-420.

Abstract: The paper examines the mass media as an instrument of energy policy in order to identify and analyze alternative information strategies for effecting: (1) gains in factual knowledge about energy conservation; and (2) attitude and life-style changes under normal and crisis conditions. The mass media have five basic functions with regard to conservation: information dissemination, (2) remedial behaviour modification, long-term lifestyle decision making, provision of triggering cues, and crisis management. Any effective campaign to change lifestyle habits must be based upon a sound comprehension of the energy problem. Information communicated to consumers must include "how-to" advice and feedback on the results of conservation. Appropriate message-media-audience packages should be designed to accomplish specific and measurable goals in order to improve the effectiveness of diffusing energy information through the mass media. Messages should be direct, simple and unambiguous; they should create dramatic associations with appropriate or inappropriate behaviour; feedback should be generated rapidly. The major implications of the review are summarized in the form of a mass media strategy matrix. It provides a number of classes of messages for each of the five tasks. Energy-media related profiles of various segments of the Canadian public must be assembled as the next step in the mass media policy-related research field.

Viladas, J.M. Company

1974 Impact of the Fuel Shortage on Public Attitudes Toward Environmental Protection.

Washington, D.C.: U.S. Environmental Protection Agency (2 volumes).

Objective: To study the impact of the energy crisis on attitudes towards environmental protection and how these attitudes relate to the effects respondents experienced as a result of the fuel shortage

Method: Telephone interviews were conducted with 500 of 3,012 respondents from a national sample study in 1973. The follow-up telephone interviewing was accomplished during May 1974.

Variables: The effect of the energy crisis on attitudes towards environmental protection

Findings/implications: The energy crisis appeared to have little impact on attitudes about fighting pollution. The most popular prospective methods of reducing fuel consumption were improving public transportation, lowering speed limits on highways and driving smaller cars. Rationing and fuel price increases were among the most unpopular steps of reducing fuel consumption. In addition, five ways of relaxing environmental control standards so as to reduce energy shortages were generally unpopular. One of these anti-environmental strategies -- letting air pollution increase in areas that now have clear air -- was the least acceptable of the entire battery of 18 potential public policy options. Strategies related to increasing the supplies of energy (e.g., increasing coal production through strip mining, building more atomic power plants and building the Alaska pipeline) were generally intermediate in public acceptability between the popular conservation measures and the unpopular anti-environmental measures. In general, people who report being affected in their lifestyles and consumption patterns by the energy crisis/fuel shortage (compared to those indicating they were not affected by the crisis) were most likely to: (1) favour policies to conserve energy, (2) favour policies to expand energy supplies, and (3) believe that these conservation and expansion of energy supply policies would be effective in alleviating the fuel shortage.

Walker, James M.

1979 Energy Demand Behavior in a Master-Metered Apartment Complex: An Experimental Analysis.
 Journal of Applied Psychology, 64, 2, 190-196.

Objective: To test whether the announcement of a monetary prize to be distributed randomly for energy conserving behaviour would increase the percentage of people exhibiting that behaviour and whether that would result in an energy consumption decrease for an apartment complex

Method: The experiment involved 325 residents (176 units) of an all-electric master-metered apartment complex in College Station Texas. A similar complex served as control. Tenants received a \$5 cash payment if certain criteria were satisfied when their apartment was checked: (1) windows and doors closed unless the cooling or heating unit was off; (2) if the cooling unit on, thermostat at 74° F or above; (3) if the heating unit on, thermostat at 69° F or below. Checking was done randomly, up to ten units/week. The experiment was conducted for four weeks in the early fall, 1976 and for six weeks in the winter, 1977.

Variables: Dependent: electricity consumption, percentage of apartments meeting checklist criteria

 Independent: announcement of \$5 cash payments

Findings/implications: In both phases, a significant proportion of apartments met the checklist criteria, compared to the pre-experiment baseline period (68% vs. 44%, 73% vs. 14%). The experimental complex achieved a significant reduction in electricity usage during Phase I (8.6% vs. control), but not in Phase II (2.2% vs. control). The results in Phase II may have been influenced by the fact that it was a warm winter, not conducive to much use of space heating. There was some evidence of the effects lingering when apartments were checked five weeks after the completion of Phase I. The effects of incentives designed to reduce energy use may vary between uses and with climatic factors. Results gathered here may not be universally applicable.

Walker, Nolan E., and E. Linn Draper

1975 The Effects of Electricity Price Increases on Residential Usage of Three Economic Groups: A Case Study.
In Texas Nuclear Power Policies, Volume V: Social-Demographic and Economic Effects, Austin, Texas: University of Texas Center for Energy Studies. Policy Study No. 1.

Objective: To determine the impact of electricity price increases on various income groups' behaviour and attitudes

Method: Marginal frequency analysis was based on a July 1974 survey of a random sample (N=60) of households in Austin, Texas to determine the impact of price increases on income groups, behaviour and attitudes, and electricity consumption changes. Data were gathered by personal interview and electricity consumption records (from a utility company) for the previous two years.

Variables: The effect of electricity price increases on three economic groups (lower, middle and upper-income) over a two-year period

Findings/implications: The number of lower-income households increasing their energy use equalled the number decreasing their energy use. For middle-income households, the number decreasing was greater than the number increasing their energy use. For upper-income households, the number increasing ran well ahead of the number decreasing electricity consumption -- suggesting that upper-income groups are the least influenced by price rises. Middle-income groups seem to show the greatest price elasticity.

8815

Warkov, Seymour

1976 Energy Conservation in the Houston-Galveston Area Complex: 1976.
Houston, Texas: University of Houston Energy Institute, October.

Objective: To monitor changes in lifestyles, attitudes and energy related behaviour in the Houston area

Method: A marginal frequency analysis of Houston-area residents' energy conservation and usage practices as related to income level and home ownership, based on a spring/summer 1976 random sample telephone survey (N=3019) of Houston and Galveston metropolitan residents.

Variables: Energy conservation-related attitudes and behaviour by household income level

Findings/implications: During the 12 months preceding the interviews:
(1) 75% of the respondents reported curtailment in the use of electric lights in their homes, with 65% also reporting curtailment in the use of air conditioners; (2) 54% said they or other household members had reduced family or personal driving; (3) 29% reported that they "bought a car that consumes less gas"; (4) 26% indicated that they and/or other household members reduced the amount of driving to and from work by using carpools; and (5) 14% had insulated their home or apartment. Virtually no difference was found between the 12 income groups selected with respect to the use of electric lights, but the higher income levels curtailed air conditioning less. Regarding family or personal driving, both the highest- and the lowest-income level households were least likely to report this mode of energy conservation. This was also true for carpooling. The likelihood of insulating proved to be directly related to income level, as did the greater likelihood of reporting purchase of a more energy-efficient car.

Warkov, Seymour

1978 Community Characteristics Predicting Public Interest in Household Solar.

Paper presented at International Symposium - Workshop on Solar Energy: Cairo, Egypt.

Objective: To identify various socioeconomic and institutional dimensions of the diffusion process affecting public acceptance and utilization of household solar hot water heating technology

Method: Requests for information concerning the "HUD Presidential Hot Water Initiative" were analyzed by examining characteristics of the towns in Connecticut where the requests originated. Over 3,000 requests had been made. The list was culled so as not to duplicate in-state addresses (N=2254 households, N=2407 including business and government requests). U.S. census data (1970) was used to obtain socioeconomic and demographic characteristics of Connecticut's 169 towns.

Variables: Factor solutions yielded three major factors: (1) a socioeconomic status factor, major elements of which were median dollar value of owner occupied, single unit housing and a socioeconomic index score standardized for median education, income and occupation; (2) a size density factor, prominent elements of which included population size and density and ethnic social organization; and (3) a family structure factor, major elements of which included the percentage of the town's population 14 years of age and over who are married, and a Youth Dependency ratio score.

The factors were entered into a regression equation.

Findings/implications: The two variables of socioeconomic status and the size-density explain one-third of the variation in the rates of household interest in the program. The family structure variable offers no independent contribution to the explanation of differences in town rates. More interest came from towns which were relatively advantaged in social composition and in access to material resources and were suburban or non-urban. It may be that the inclusion of the socioeconomic factor was inevitable, given that there were certain eligibility criteria for the program and given the media campaign used to publicize the program. The issue of social equity is thus raised, emphasizing the need for policy makers to consider the equity impacts of energy policies.

8825

Warkov, Seymour, Harte, Patricia, and Stephen Sharkey

1977 Student, Staff and Faculty Attitudes and Behaviors with Respect
to Energy Use and Conservation
Storrs, Connecticut: The University of Connecticut.

Objectives: To describe the results of a series of surveys conducted as part of an energy conservation project at the University of Connecticut at Storrs

Method: The first group of surveys was administered to residence students: four surveys were completed (fall and winter, 1974-75 and 1975-76.) The second group was administered to students in five particular dormitories in the winters of 1974-75 and 1975-76. The third survey was completed by "professional" and "classified" employees of the university during the winter of 1974-75.

Variables: Reported temperature in dorm room; weekends spent on campus; beliefs regarding the existence (present or future) of energy crisis; ranking of problems facing the country; conservation practices engaged in and willingness to participate in if necessary; use rates of appliances and potential for reduction; attitudes regarding priorities in heating campus facilities; attitudes regarding responsibility for control of heat; knowledge of instances of waste on campus

Findings/implications: Concern about the energy crisis among students diminished over the two years, as did their conviction that an energy crisis exists or would exist in the future. The energy crisis was ranked sixth in importance on a list of domestic problems facing the United States. Students experienced overheating in their dorm rooms (especially in winter) and reacted by opening windows, since they were unable to control heat. They engaged in some conservation practices but were less receptive to those involving more personal sacrifice (e.g., giving up the use of certain appliances). The surveys of the five different dorms found some differences in physical conditions but findings were generally similar to those in the initial surveys. In comparing employees and students, the overall patterns of practices were quite similar. Specific group interests were revealed in attitudes regarding priorities in heating campus facilities. The differentiated functions performed by the groups and their specific interests present barriers to achieving unanimity on the various energy-related issues. There is potential for energy saving but the different groups must be reached by different communication channels in order to reach all sectors effectively.

8830

Warren, Donald I.

1974 Individual and Community Effects on Response to the Energy Crisis of Winter 1974: An Analysis of Survey Findings from Eight Detroit Area Communities.

Ann Arbor: University of Michigan, Institute of Labor and Industrial Relations, Program in Community Effectiveness.

Objective: To determine responses to and attitudes towards the energy crisis

Method: A random sample survey was taken of 766 households from April to June 1974 in eight Detroit area communities using interviews. Data were statistically analyzed for individual and socioeconomic correlates.

Variables: Effects of income level, individual conservation behaviour, employment status, household characteristics and community setting on attitudes towards the winter 1973-74 energy crisis

Findings/implications: The energy crisis of 1973-74 was perceived by respondents as a failure of U.S. institutions rather than as a result of actions of foreign countries. It was experienced most prominently by the middle class (\$10,000+ incomes). Those with incomes below \$10,000 were less likely to report that they had experienced shortages or had cut back in the use of energy. The vast majority of respondents indicated some energy-conserving behaviour. The individual's social setting played a major role in respondents' perceptions and attitudes.

8835

Warren, Donald I, and David L. Clifford

1974 Local Neighborhood Social Structure and Response to the Energy Crisis of 1973-74.

Ann Arbor: University of Michigan, Institute of Labor and Industrial Relations, Program in Community Effectiveness.

Objective: To determine the role of the local neighbourhood social structure in the energy crisis of 1973-74

Method: Statistical analysis was carried out of a random sample interview survey (N=766) of households in eight Detroit area communities conducted from April to June 1974.

Variables: The effect of neighbourhood typology (six varieties of local contexts) on individual attitudes; responses to the energy crisis

Findings/implications: The typology provided an important source of explained variance in perceptions, reported behaviour and helpful sources of information. These differential patterns tended to follow closely those theoretically predicted by the concepts describing each neighbourhood type. "Integral" and "Stepping-Stone" types of neighbourhoods were highest in perceiving the energy crisis as real, while the "Anomic" type was lowest.

Wascoe, Nancy E., et al.

1976 The Effects of Fear Appeals Upon Behavioral Intentions Toward Energy Consumption: A Replication.

Institute of Behavioral Science, University of Colorado.

Objective: To determine the effect of fear appeals on behavioural intentions regarding energy consumption

Method: During February through May 1976 students in the University of Colorado School of Business read one of eight communications, then completed an attitude and behavioural questionnaire. The communications were the orthogonal combinations of three two-level factors -- probability, severity and efficacy (to responding individual) in connection with energy shortage. A behavioural measure was also included: whether or not students responded to an invitation to join an energy conservation project. Data were evaluated via a 2 x 2 x 2 analysis of variance.

Variables: The effect of fear appeals upon behavioural intentions toward energy consumption

Findings/implications: Students who read the "severe negative effects" communication expressed stronger intentions to conserve energy, as did those who read the high efficacy communication (but only with regard to group conservation activities). The probability factor had no effect. None of the three factors was found to affect actual behaviour.

8845

Wascoe, Nancy E.

1978 Effects of Noxiousness, Efficacy of Individual Efforts, and Implied Personal Responsibility Associated With An Energy Crisis Upon Attitudes, Behavioral Intentions, and Behavior Regarding Energy Conservation.

Ph.D. dissertation, University of Colorado at Boulder.

Objective: To examine the effects of some variations in the content of persuasive communication regarding energy conservation on subsequent attitudes and behaviour.

Method: Communications were read by 150 subjects. They and 20 others completed questionnaires concerning attitudes and behaviours with regard to energy conservation. These subjects were observed regarding actual behaviour.

Variables: Dependent: attitudes, behaviours

Independent: communications varied with regard to three factors: (1) noxiousness of an energy crisis (high or low); (2) efficacy of individual efforts to avert a crisis (high or low); (3) specification of the behavioural implications of attitudes regarding energy conservation (present or absent).

Findings/implications: Attitudinal variables and behaviour were differentially affected by the three independent variables. Intentions to perform home conservation practices and actual behaviour, were influenced by the efficacy variable. It was concluded that persuasive communications can be used effectively to change both attitudes and behaviour. Messages should be designed to take advantage of the differential effects of the variables. It is suggested as well that attitudes do exert a directive influence on behaviour.

Webber, Robert E.

1979 An Evaluation of the Tennessee Energy Authority - Energy Extension Service Energy Hotline.
Nashville, Tennessee: TEA-EES.

Objective: To examine in detail the administration and operation of the TEA-EES Energy Hotline and its impact on persons using the service. The hotline was established to serve the energy information and assistance needs of all Tennesseans.

Methods: The hotline was established in January 1978. The data analyzed in this report were collected from that date until February 28, 1979. Operators collected some information from callers (see variables). As well, a postcard survey of 168 users was taken (67 usable responses were obtained).

Variables: Operators recorded: who called the line, when they called, why they called, where they learned about the service, where they would use the information, action taken by operator

Postcard survey: judgement about usefulness of service, action taken on basis of information provided, service found most useful

Findings/implications: Over the 14-month period, 4,515 contacts were made: 1,322 in the last two months and 593 in the first two. The majority of clients (62%) used the information provided at home, while 16% used it at work. Nearly 15% heard about the hotline from television or radio; 12% learned of it from friends. One-third of the calls involved requests for information, while 13% concerned the Aeroscan project. This project took infrared aerial photos of several city blocks, revealing gross temperature differentials of objects in the viewing area. The pictures were displayed in public areas and interpreters helped consumers to identify their homes and discuss ways to cut heat loss. Many respondents (55%) found the information very useful and a further 33% found it somewhat useful. Half had acted on the information and another 40% thought they would act.

WeiJo, Richard

1979 Consumer Behavior and The Energy Crisis: What Can Marketing Do?
Working Paper, University of Minnesota.

Abstract: The paper explores what marketing can do to convince consumers to conserve energy and, specifically, to focus on the influences of promotion on energy attitudes, intentions and behaviour. It presents an elementary model of consumer behaviour and categorizes a number of studies by the aspects of the model they have examined. The present state of knowledge in this area and conclusions are drawn about directions for further research by examining the findings of the various studies. The report examines the influence of three factors on energy-related behaviour: promotional sources, personal influences and attitudes, and intentions and situational factors. Five major types of promotions have been examined in studies: (1) fear appeals (most effective when high magnitude energy crisis depicted but they must be accompanied by the promise that it is avoidable); (2) information (effects are generally small and temporary); (3) point-of-purchase prompts (effective only on a short-term basis); (4) feedback (necessary but not sufficient to elicit energy-conservation behaviour); and (5) rewards (extrinsic and intrinsic rewards and intrinsic value; results of studies are promising thus far). Research is needed on the differential effects of each of the sources and on the longitudinal effects of the variables. In terms of personal influences, studies have examined the effects of sociodemographic factors on energy attitudes and behaviour. More research is required on the lack of awareness of those who are unwilling to be conservation oriented (inadequate information sources or perceptual screening?). As well, more research is needed into the differential the effects of information sources on energy conservation segments (e.g., the effects of varying fear levels on separate demographic segments). Studies on the influences of attitudes, intentions and situational factors on energy-related behaviour seem to indicate that there may be significant differences between attitudes and actions, and that situational factors can intervene between the two. Studies on energy consumption must measure behaviour, not just attitudes.

Other areas of further research are thus suggested: What is the differential effect of promotional sources in changing attitudes and actions for various demographic or lifestyle segments? What situational factors influence energy consumption? Are situational or behavioural factors better predictions of energy conservation efforts?

Welling, L.G.

1978 Shaping Consumer Attitudes: The Overlooked Ingredient.
Columbia, Ohio: Battelle - Columbus Labs.

Abstract: The government must understand that psychology as well as dollars are at work in every consumer purchase decision. Most people express a desire to save energy, but there is a large discrepancy between this attitude and their behaviour. It is only by formulating and implementing a balanced policy, incorporating development of new energy supplies with increased focus on the human behaviour aspect of energy conservation, that progress will be made in meeting the threat of energy shortages. Reference is made to a paper, Social Aspects of Energy Conservation (EAPA 3:3244), in which Olsen and Goodnight outline three broad categories of behavioural and social theories that may be applicable to the conservation of energy; namely, personal evaluation, which focuses on changing the perception, attitudes and values of individuals; interpersonal incentives, exchanges and influence; and social ordering, which focuses on social mobilization, control and structuring.

Note: Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

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Whittier, J., Jurkiewicz, B., and W. Fisher

1977 Energy Conservation in Buildings: The Missouri Plan.

Presented at UMR-DNR Conference on Energy, Rolla, Missouri, October.

Abstract: In 1974, approximately 23% of Missouri energy was consumed in the residential sector. In 1980, this figure is projected to be 21%. The reduction reflects conservation activities already implemented and the increased use of electric heating at higher end-point efficiency. Estimates suggest that energy savings of nearly 50% could be achieved in this sector, primarily by upgrading the thermal efficiency of building structures and changing user behaviour patterns. This has become a major target of the Missouri Energy Conservation Plan. The intent of the residential portion of the conservation plan is to establish a variety of programs ranging from mandatory practices through incentive and assistance programs to persuasive voluntary programs, reinforced by a strong set of public awareness and energy conservation education programs.

The commercial/institutional sector uses 20% of the energy consumed in Missouri. Approximately 75% of this is used for lighting and space heating. Experience and estimates suggest that energy demand in new buildings can be reduced by as much as 60% but the average is 30 to 40%. Energy consumption in existing buildings can be reduced from 15 to 20% with little, if any, initial costs; 15 to 25% additional savings can be achieved through investments that can be recovered in less than three years, based on 1977 fuel costs. Given this potential, the reduction of energy demand in this sector is a second objective of the Missouri Energy Conservation Plan, which is described in detail.

In conclusion, the potential for energy conservation in buildings is very high, even though the savings between now and 1980 appear low (.31% for new residential/commercial buildings and .95% for efforts in existing residential/commercial buildings).

Note:

Abstract obtained from:
Technical Information Center
Department of Energy
Washington, D.C.

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Wildhorn, Sorrel, et al.

1974 How to Save Gasoline: Public Policy Alternatives For the Automobile.

(Publication No. R-1560-NSF).

Prepared for the National Science Foundation by The Rand Corporation.

Objectives: (1) to develop analytical tools to help evaluate national energy conservation policies for private transportation; and (2) to apply the tools in a systematic analysis and comparison of several alternative measures and policy instruments

Method: Several econometric models were used to compare and evaluate various policy instruments. They included the automobile design model, the automobile fleet mix model and the NAV model (used for demand for motor fuel).

Variables: Dependent: gasoline consumption

Independent: Production by year by auto design type; production by year by size of auto; the number and age distribution of autos in the existing fleet; auto retirement rate; new car sales; vehicle mileage by car type

Findings/implications: The only way to reduce gasoline usage significantly in the short term (one to four years), aside from limiting supply, is to increase the price of gasoline. In the longer term, technological improvements in the cars themselves offer greater potential for savings than higher prices. Taxes used to discourage the sales of less efficient autos would probably not be effective, as the turnover rate of the fleet would fall (demand for used cars would rise). Any tax should thus be levied on used cars as well. The introduction of new, more efficient cars will be more rapid if these cars can be sold at lower prices than the less efficient cars (both new and used). The analysis presented predicts that increases in gasoline prices will reduce gasoline usage: a 1¢ per gallon rise in price would lead to a 1% decrease in consumption. New technology could potentially reduce gasoline consumption by as much as 40% by 1995 (compared to what it would be if no new technology were introduced). Some of these changes would result in lower purchase and lifecycle costs for cars; some would result only in lower lifecycle costs. An average new car fuel economy standard of between 21 and 38 mpg is feasible and any legislation should reflect this possibility. Gasoline taxes and regulatory measures (regarding technological improvements) can be combined to yield a constant percentage decrease in gasoline consumption over time.

Willenborg, John F. and Robert E. Pitts

1977 Gasoline Prices: Their Effect on Consumer Behavior and Attitudes.

Journal of Marketing, January, 24-31.

Objective: To assess consumers' reactions to changes in gasoline prices

Method: Survey research was carried out of a consumer panel randomly recruited from urban South Carolina in the period January 1973 to July 1975. During this period, the panel increased from 300 to nearly 900 households.

Variables: Dependent: miles driven annually per car owned by the household; number of cars and engine size of each; intentions to increase or curtail driving; intentions to purchase large vs. small cars within six- or 12-month time periods.

Independent: price of gasoline

Findings/implications: (1) The price mechanism was relatively ineffective in reducing consumption of gasoline when prices increased gradually over time. (2) The phenomenon of consumer attitudinal and behavioural adjustment was evident as consumers adopted to changing levels of gasoline prices.

Authors note the following implications: (1) consumers are unlikely to decrease the number of miles which they drive in any short-term period, except in reaction to a crisis situation; (2) gasoline consumption may be decreased in the short-term through legislation; and (3) policy makers are not likely to be successful in reducing consumption by using the price mechanism -- unless a dramatic increase of perhaps 100% was utilized.

Williams, Peter W., Burke, James F., and Michael J. Dalton

1979 The Potential Impact of Gasoline Futures on 1979 Vacation Travel Strategies.

Journal of Travel Research, 18, 1 (Summer), 3-7.

Objective: To examine respondent reactions to a variety of future fuel supply situations associated with: (1) the travel behaviour of individuals under varying gasoline availability conditions; and (2) the attitudes and perceptions of persons regarding travel-related energy policy

Method: 1,500 questionnaires were distributed to households in six major population centers in March 1979; 334 were returned.

Variables: Attitudes and perceptions regarding travel-related energy issues and policies; travel intentions for 1979; travel plans at various gasoline prices by those planning to travel; anticipated travel distance at various gasoline prices by those planning to travel by motor vehicle in 1979; auto travel strategy intentions with rationing at 40 gallons/month

Findings/implications: Nearly half (40%) of the respondents did not believe that the energy shortage was real (vacationers 50%, non vacationers 42%). Most people (63%) did not believe that the energy shortage would be solved in two years. Travelers were more optimistic about the availability of gasoline in vacation areas. More than half (55%) said their travel plans for 1979 were unchanged, while 43% said they intended to travel less than in previous years. Intentions at various gasoline prices indicate that travellers would shift from travelling by auto to not travelling at all, rather than shifting to other modes. At \$1.50/gallon, 50% of those currently planning trip would not travel at all. Rationing would force travellers to use gasoline mainly for work (65%), to take fewer trips (80%), to select locations closer to home (76%) and to stay longer at vacation destinations (54%). Public transportation demand would not increase substantially. The overall effects of rationing do not appear to be as great as those associated with fuel prices above \$1.25. Relative prices of gasoline are a more critical factor in the decision making process than are absolute prices.

8885

Williams, Robin M., Jr.

1976 Testimony Before the Public Service Commission of New York, Case No. 26806: Report on Recent Developments in the Design of Rates for Low-Volume Residential Electric Utility Customers, June.

Objective: To report selected data and findings from a 1975 national household energy use survey carried out by the Response Analysis Corporation

Method: The survey is basically an update and expansion of one carried out in 1973 as part of the Ford Foundation Energy Policy Project. (See the Newman and Day papers from The American Energy Consumer, above.) The 1975 random sample (N=2952) survey involved personal interviews of households nationwide, with a subsample (N=221) of New York households and a subsample (N=569) of northwestern U.S. households. Meter data were collected for the households surveyed.

Variables: The relationship between income and other socioeconomic characteristics and the consumption of electricity

Findings/implications: The correlation between income and electricity usage was determined to be generally the same for all U.S. households, for those in the northeast and for New York State. That is, the poor use much smaller amounts of electricity than the average household and about half or less of the amount used by the well off. For New York State the range in average monthly kilowatt hours consumed is 335 for the poor to 761 for the well off. According to the survey, the poor tend to live in smaller quarters, to use electricity less for air conditioning and to have a smaller number of electric appliances than the well off. The poor also spend proportionately more of their income for the electricity they use. The results of the 1975 survey corroborate those of the 1973 survey.

Winett, Richard A.

1978 Promoting Turning-Out Lights in Unoccupied Rooms.
Journal of Environmental Systems, 7, 3, 237-241.

Objectives: To report on a pilot study evaluating signs and stickers used to promote energy conservation

Method: The experiment took place over six weeks in three rooms (two control, one experimental) at the University of Kentucky. The treatment varied: weeks 1 and 2, observation, no signs; week 3, small sign; week 4, stickers on light switches; week 5, a large sign; week 6, two additional signs. Rooms were checked once a day around 6:00 p.m. (they were unoccupied at this time) to see if lights had been left on.

Variables: Dependent: lights on/off

Independent: treatment

Findings/implications: Only during weeks 5 and 6 when large, special signs were displayed were the lights in the experimental room turned out significantly more often. In the control rooms, the lights were left on 78% of the days. In the experimental room, lights were left on 95% of the days in the first four weeks and 40% in the last two. It was concluded that signs and stickers may not affect or promote energy conservation.

Winett, Richard A., and Michael T. Nietzel

1975 Behavioral Ecology: Contingency Management of Consumer Energy Use.

American Journal of Community Psychology, 3, 2, 123-133.

Objective: To determine the relative effects of monetary incentives and information on the consumption of natural gas and electricity

Method: From January 31 to March 28, 1974 a study of two volunteer groups in Lexington, Kentucky was conducted. One group (N=16) received monetary incentives and the other (N=15) information on how to conserve electricity. A one-way analysis of variance techniques was used to analyze the data.

Variables: The relative effects of monetary incentives and of information alone on energy conservation behaviour

Findings/implications: The incentive group averaged approximately 15% more reduction of electricity than the information group. This statistically significant difference was maintained in follow-ups.

Winett, Richard A., Kaiser, Stephen, and Gerald Haberkorn

1977 The Effects of Monetary Rebates and Daily Feedback on Electricity Consumption.

Journal of Environmental Systems, 6, 4, 329-341.

Objective: To investigate further daily feedback in a situation where electricity was used for lighting, appliances and air conditioning.

Method: The experiment was conducted from March to May in a 30-unit apartment complex in Lexington, Kentucky. Six experimental units and six control units were involved. In week 1, the experimental units were on a high rebate system (including feedback), which was replaced in week 2 for three units by a lower (50%) rebate system. In weeks 3 to 6, feedback only was given. Interviews were conducted with participants at the conclusion of the experiment.

Variables: Dependent: KWH used/day

Independent: treatment (included daily and weekly feedback and/or rebates and information); conservation measures taken

No formal statistical analysis was done.

Findings/implications: On 33 out of 42 days the experimental units reduced their electricity usage more than the control units did (range 1 to 45%, average 25%). In the feedback only condition, their usage was lower on 21 out of 28 days. The authors conclude that daily feedback, preceded by a high rebate system, can result in an average reduction of 10 to 15% in electricity use in an apartment setting. Feedback was not effective on the very warm days. Its effects on participants varied widely. The low rebate system was not much more effective than feedback alone. A feedback device of some sort that could be installed in an apartment would be very useful.

Winett, Richard A., et al.

1978 Effects of Monetary Rebates and Daily Feedback and Information on Residential Electricity Conservation.
Journal of Applied Psychology, 63, 1 (January), 73-80.

Objective: To study the effects on residential electrical consumption of two rebate or rate schedules, one representing a large price change and the other a moderate, more feasible price change, weekly feedback and educational information

Method: The study was conducted in College Station, Texas during the summer of 1975. Of the 496 randomly selected households invited to take part in the study, 129 enrolled and 107 yielded usable data. Participants were assigned to one of five experimental conditions. All completed a post-experiment questionnaire.

Variables: Dependent: percentage reduction in electricity use, based on actual weekly meter readings by the research staff

Independent: treatments: (1) a high monetary rebate, in which participants received conservation information, weekly written feedback on their electricity use and monetary rebates amounting to a 240% price change in electricity; (2) a low monetary rebate, with the same structure except that rebates amounted to a 50% price change; (3) weekly feedback, whereby participants received information but no rebates; (4) an information condition; and (5) a control group; demographics.

Findings/Implications: Analysis of the data for four weeks indicated that price rebates (low or high), combined with feedback and information, resulted in a significant decrease in electricity use compared to the condition in which only information was received. Overall, the results indicated that only the high rebate system yielded substantial reductions in electricity use. The low rebate system was marginally effective, while the feedback and information system did not alter electricity use. Information alone may in fact, increase use. The questionnaire suggested that conservation was related mainly to use of the air conditioner. More long-term strategies might be used in conjunction with the rebates and feedback in order to promote more conservation. Reducing the public's skepticism in the energy crisis might make these short-term measures more effective.

Winett, Richard A., et al.

1978 Effects of Feedback on Residential Electricity Consumption: Three Replications.
 Journal of Environmental Systems, 8, 3, 217-233.

Objective: To investigate different types of daily feedback systems with consumers of different income levels living in three kinds of residential structures

Method: The project was conducted during the summer of 1977 in Greenbelt, Maryland. A total of 121 households were involved. They were divided into three groups differing in size, family income and baseline energy use as well as in type of dwelling. Questionnaires were distributed to all participants (the return rate was 90%).

Variables: Dependent: actual electricity consumption

Independent: demographics; treatments: (1) area A: individual feedback (N=21), group feedback (N=14), control (N=22); (2) area B: a combination of individual and group feedback (N=11), control (N=10); and (3) area C: individual feedback (N=16), combination (N=13), control (N=14).

Findings/implications: Within groups, there was generally no significant difference in baseline energy use. In Area A, the individual feedback group (IFB) used consistently less electricity than the control group. The group feedback subjects (GFB) did well for a week. The IFB group used 7% less electricity than control, overall. In Area B, the feedback group used 20% less electricity than control. They consistently used less on the very hot days. On the whole, the group feedback yielded negligible reductions. It is not clear exactly what makes the individual feedback effective. High users of electricity (correlates with high-income groups) should be the targets for conservation efforts. The reduction achieved in the high-use households could have a much greater impact on demand than comparable reductions in lower-use areas. Conservation efforts should be intensified during the hottest and coldest periods of the year. Energy monitors are being developed which might be used to provide feedback. An alternative is to train people to read their own meters.

8915

Woodson, Herbert H., et al.

1976 Direct and Indirect Economic, Social, and Environmental Impacts of the Passage of the California Nuclear Power Plants Initiative. Austin: The University of Texas, Austin Center for Energy Studies.

Objective: To evaluate the likely impacts of the California nuclear power plants initiative

Method: A set of scenarios is used to project low, medium and high electric energy demand growth rates, in conjunction with different electric energy supply alternatives. Analytical models were employed to study the interaction of the following components: conservation assessment, electrical energy demand/supply/projection/cost analysis, long-run economic growth assessment, sociocultural assessment and environmental and health impacts assessments. Results are reported for 1977, 1985 and 1995.

Variables: Projections of the direct and indirect economic, social and environmental impact of enactment of the California nuclear power plants initiative

Findings/implications: California apparently will need additional electricity. Large-scale supplies may be required in addition to hydro, geothermal and solar energy resources. Elimination of nuclear energy as an alternative would force increased reliance on other energy sources which possess their own impact, risks and uncertainties. Nuclear energy is assumed to provide the lowest cost electricity compared to coal and oil, leading the authors to conclude that elimination of nuclear energy will cause the price of electricity to rise in California. The scenarios show that there may be few overall economic or sociocultural effects should nuclear power be phased out, provided that alternatives are available. Increased use of coal could have significant sociocultural and environmental effects in nearby states, especially in terms of air and water quality. Increased use of oil could have an adverse impact on California's air quality and would be contrary to the goals of Project Independence. The uncertainties related to nuclear waste and the fuel cycle are noted.

Worrall, Jay W.

1976 Labeling and Consumer Information Programs for Refrigerator - Freezers: A Study of the Effectiveness of Energy Use Labeling as a Device to Increase the Efficiency of the Nation's Appliances. Washington, D.C.: National Bureau of Standards.

Abstract: Specific objectives of the study are to: (1) review, summarize and criticize other past or ongoing energy-related labelling programs and infer the characteristics of the most successful approaches; (2) design and execute an experiment to assess the effectiveness of energy use and the cost of operation labelling for modifying consumer purchasing decisions; and (3) investigate the attributes of effective public information and educational activities that would be conducted along with the national labelling effort.

8925

Wright, Susan

1975 Public Responses to the Energy Shortage: An Examination of Social Class Variables.

Unpublished Ph.D. dissertation, Iowa State University.

Objective: To investigate the relationship between social class and perceptions of energy shortages

Method: Interviews from a random sample (N=190) of Des Moines, Iowa residents, stratified by social class criteria, were used to investigate relationships between social class and perceptions of energy shortages.

Variables: Social status measures in relation to energy shortage response variables

Findings/implications: Correlational analysis revealed significant relationships between each of the energy shortage response variables (e.g., attribution of responsibility for the energy crisis) and at least one of the social status indices (education, income, occupation and so forth). The strengths of these relationships, however, were not sufficiently large to indicate a general social class polarization of interests over the energy crisis issue.

Yavas, Ugur, and Glen Riecken

1978 Demographics As a Predictor of Energy Conservation Behavior.
Presented at Joint National Meeting of ORSA/TIMS, Los Angeles,
November.

Objective: To explore the relationships between consumers' knowledge of energy conservation and their energy-conserving behaviour patterns

Method: Five hundred residents of a midwestern city were contacted and 385 usable personal in-home interviews were completed.

Variables: Level of knowledge about energy conserving measures; reported energy conserving steps taken by respondents; demographics (education, occupation, age, income, sex, marital status and type of housing)

Respondents were categorized as very knowledgeable, moderately knowledgeable and less knowledgeable.

Findings/implications: The three groups were similar in terms of demographic characteristics except for sex: male respondents were more knowledgeable than female respondents about energy conservation. Consumers with varying levels of knowledge were found to be similar in relation to their energy-conserving ethics behaviour. No difference was found between the groups with regard to their behaviour in terms of spending money on products that help save energy. Some form of incentive to induce people to purchase energy savings products is needed (perhaps tax benefits or some form of "negative incentive").

Young, Jeffery W., et al.

1975 Land Use and Energy Flow at the National Level.
Simulation, 24, 1 (January), 113-116.

Objective: To examine the interaction of the agricultural and energy sectors at the national level using a simulation model

Method: The model, SPECULATOR, simulates certain hypothetical interactions between national level import vs. agricultural export policies and the urban population density vs. the transportation characteristics of U.S. urban areas. Runs are reported for 1970, 1975, 1985 and 2000. The secondary data used are from various sources.

Variables: Per-capita gasoline demand, population size and age structure, price of agricultural land, acreage harvested, wheat exports, etc.

Findings/implications: Preliminary simulations demonstrate inherent homeostatic mechanisms. Results of three runs with differing assumptions are given. Although the quadrupling of petroleum prices by OPEC has had a major impact on the U.S. economy, it can be inferred from the model that the overall impact may have certain positive effects, (e.g., the boosting of U.S. agricultural production and exports).

Zentner, Rene D.

1977 Communication -- The Real Energy Gap.
 The Journal of Energy and Development, 2, 60-75.

Objective: To analyze the dimensions of public understanding of a few key energy issues

Method: The data was derived from widely circulated national opinion surveys (Louis Harris and Yankelovich, Skelly and White) conducted from 1973 to 1975.

Variables: Attitudes regarding: the problems facing the country; the seriousness of the energy crisis; the "villain" in the energy crisis; confidence in information sources about energy; general performance of the oil and energy companies; reported energy conservation behaviours

Findings/Implications: During the period analyzed, at least 66% of Americans felt that the energy crisis was very or somewhat serious. The high point came in November 1973 (87%). Perceptions of the seriousness of the crisis were higher in 1975 than in 1974. In 1975, the top culprits perceived to be responsible for the energy shortage were: oil companies (65%); Arabs (53%); the federal government (47%); the public (36%); and electric utilities (29%). The public and Arabs were being blamed by more people and the oil companies and federal government by fewer. Americans believe that they are taking dramatic steps to conserve energy in terms of their own behaviour. The oil companies are generally resented and distrusted, seen as being most to blame for the energy problem, and not to be trusted as an information source regarding energy (69%). They were also ranked second on a list of 27 industries as having contributed to inflation by seeking higher profit rates. Until the public understands more of the nature of the energy crisis, it will be difficult to implement a workable national energy policy. The energy companies and the media have a role to play in communicating information more effectively to the public regarding the energy crisis.

9810

Zucchetto, James

1975 Energy-Economic Theory and Mathematical Models for Combining the Systems of Man and Nature.

Case Study: The Urban Region of Miami, Florida. Ecological Modeling 1, 241-268.

Objective: To study energy flow and the relationship between energy theory and economics in the Miami, Florida area

Method: Economic, natural system and energy data were compiled for this region for the period 1950 to 1972. These data were analyzed by cross-correlation (i.e., a technique for determining how well two functions track each other in time) and used for a simulation model on an analog computer.

Variables: The systematic interactions of socioeconomic factors (e.g., retail sales, food, population, building structure, and taxes) and natural variables (e.g. rainfall, wind and pollution assimilated by the environment), energy flows and shortages

Findings/implications: Cross-correlations showed significant levels of correlation between the rate of change of fossil fuel use and the rates of change of population, budget, sales tax, income, building structure and number of telephones. It was determined from the simulation that the ratio of natural to fossil fuel energy changed from 1.77 in 1950 to 0.25 in 1972.

Zuiches, James J.

1975 Energy and the Family.

East Lansing, Michigan: Michigan State University, Department of Agricultural Economics. Cooperative Extension Service Report No. 390.

Objective: To report the initial findings from a five-year longitudinal in-depth study of energy and the family

Method: A bench-mark cross-section was established in May-June 1974, when a multi-stage area probability sample (N=217, 160 urban and 57 rural) of Lansing, S.M.S.A. families was surveyed by self-administered questionnaires and personal interviews.

Variables: Energy use as related to attitudes, food consumption, transportation, housing conditions, financial expenditures and resources, and the character and quality of the family's functioning in terms of interaction patterns within the family, with friends, relatives and the larger community

Findings/implications: Respondents were evenly divided about the reality of the 1973-74 energy crisis, 30% believing energy shortage will be crucial within five to ten years. Acceptability of specific energy policies varied by sex and location; from most to least were urban females, urban males rural females and rural males. Least acceptable policies involved severe restrictions, regulation or rationing. A positive association was found between education, energy awareness and policy acceptance. Preliminary results are also reported for changes in family nutritional status, household energy use and the effect of homemaker employment on household energy consumption.

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Zuiches, James J.

1976 Acceptability of Energy Policies to Mid-Michigan Families.
East Lansing, Michigan: Michigan State University, Agricultural
Experiment Station. Research Report No. 1976.

Objective: To assess consumers' attitudes towards the energy problem
and various possible government interventions

Method: Marginal frequency analysis of the attitudes of a 1974 sur-
vey of Lansing S.M.S.A. (N=217) families towards the energy
crisis.

Variables: Respondent attitudes with respect to energy policies

Findings/implications: A bare majority of respondents believed the cri-
sis to be real. There was wide divergence in the accept-
ability of specific energy-saving policies. In general, ur-
ban females were most favorable to each policy. Policies
that would restrict electrical use, ration meat, increase
taxes for large families and manipulate school seasons were
of limited acceptability (less than 20%). Most respondents
supported policies for reestablishing local grocery stores,
tax deductions for home insulation and home improvements,
increased home gardening and more food preparation at home.

Zuiches, James J.

1976 Coercion and Public Acceptance: The Case of Energy Policies.
Paper presented at the Annual Meeting of the Society for the
Study of Social Problems, New York, August.

Objective: To determine the acceptability of various energy policies
that would directly or indirectly affect energy conservation
by consumers

Method: An evaluation model based on Theodore J. Lowi's typology of
public policies is used to determine the acceptability of
various energy policies that would directly or indirectly
affect energy conservation by consumers. Data are from two
surveys of the Lansing SMSA taken during spring 1974 (N=216)
and spring 1976 (N=259). The model of policy acceptance em-
ploys path analysis. Results are compared with a partial
regression model of energy policy as affected by sex,
urban/rural residence, energy awareness, belief in the ener-
gy crisis and education.

Variables: The effect of socioeconomic characteristics (e.g., urban/
rural residence and male/female gender) on attitudes toward
four policy types: (1) distributive (policies without nega-
tive sanction); (2) constituent-voluntaristic (policies af-
fecting the individual's environment but not entailing coer-
cion); (3) regulative (policies with explicit negative sanc-
tions); and (4) redistributive (policies which affect indi-
viduals through their environment in an involuntary way)

Findings/implications: Regulative and redistributive policies had the
lowest levels of support, being on the average acceptable to
about one-fourth of the respondents in 1974 and one-third in
1976. Voluntaristic policies with no value-laden implica-
tion scored highest (75% in 1974). Distributive policies
were acceptable to 43% of the respondents in 1974 and 54% in
1976. In general, urban women were most favorable to each
policy. Urban males, rural females and rural males, in des-
cending order, found the policies less acceptable. The par-
tial regression model did a better job than the coercion
model in explaining levels of acceptance of energy poli-
cies.

Zuiches, James, et al.

On- Changing Family Energy Behavior Through Infra-Red Heat Loss Eval-
going uation: An Experimental Approach.
Ongoing study at Michigan State University, April, 1977 through
November, 1977.

Abstract: This study is an experimental extension of an ongoing five-year longitudinal survey of Lansing S.M.S.A. households to assess changes in energy conservation attitudes, behaviours and actual consumption from utility company records, pursuant to feedback (an array of alternative actions are presented to families). Hypotheses tested derive from the pre-treatment survey findings. Thermographic photography and a computer analysis of individual residential energy efficiency are used together to determine the heat loss situation and recommended changes. This information is then conveyed to the experimental subject. The experimental design entails three kinds of feedback treatments, two types of delivery treatments and a control group. Households were stratified by income levels and residential location, then randomly assigned to control and treatment groups (N=40 for each) from the different strata. Analysis of variance is to be used to evaluate the data. Findings are not yet reported.

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